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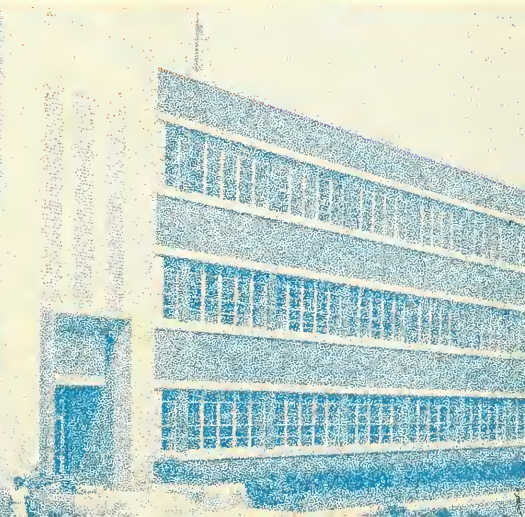
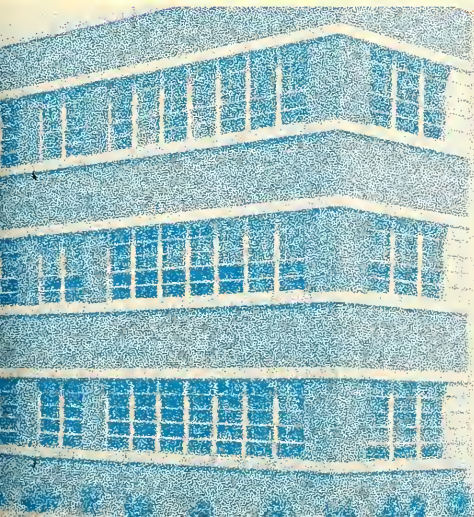
N. C. A & T State University

~~Greensboro~~, N. C. 27411

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NORTH CAROLINA
AGRICULTURAL AND TECHNICAL
STATE UNIVERSITY
1972



VOL. 63, NO. 1

APRIL, 1972

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THE BULLETIN
of
NORTH CAROLINA
AGRICULTURAL AND TECHNICAL STATE UNIVERSITY
Greensboro

CO-EDUCATIONAL INSTITUTION
SEVENTY-FIFTH ANNUAL
CATALOGUE 1971-72
WITH ANNOUNCEMENTS FOR 1972-73
GREENSBORO, NORTH CAROLINA

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UNIVERSITY CALENDAR 1972-1973

FALL SEMESTER 1972

August 21—Monday
August 22-23—Tuesday-Wednesday
August 23—Wednesday
August 24-26—Thursday-Saturday
August 28—Monday
September 4—Monday
September 5—Tuesday
September 19—Tuesday
October 23-28—Monday-Saturday
November 3—Friday

November 22—Wednesday

November 27—Monday
December 14—Thursday
December 15—Friday
December 19—Tuesday
December 19—Tuesday

Freshmen and transfer students report
Orientation and advisement of freshmen
Upperclassmen report
Registration
Classes begin
Labor Day Holiday
Classes resume, Last day to add a course
Fall Semester Assembly
Mid-semester Evaluation
Last day to drop a course without grade evaluation
Thanksgiving Holidays begin at 1:00 p.m.
Classes resume at 7:00 a.m.
Reading Day
Final examinations begin
Final examinations end
Fall Semester ends, Christmas Holidays begin

SPRING SEMESTER 1973

January 10—Wednesday

January 11-13—Thursday-Saturday
January 15—Monday
January 22—Monday
February 6—Tuesday
March 5-10—Monday-Saturday
March 15—Thursday

March 15—Thursday
March 26—Monday
April 23—Monday
April 24—Tuesday
May 7—Monday
May 8—Tuesday
May 12—Saturday
May 13—Sunday

Freshmen and transfer students report for orientation
Registration
Classes begin
Last day to add a course
Spring Semester Assembly
Mid-semester Evaluation
Last day to drop a course without grade evaluation
Spring Holidays begin at 10:00 p.m.
Classes resume at 7:00 a.m.
Holiday
Classes resume at 7:00 a.m.
Reading Day
Final examinations begin
Final examinations end
Commencement Exercises

1972

FEBRUARY							MAY							AUGUST							NOVEMBER									
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S			
			1	2	3	4	5				1	2	3	4	5	6				1	2	3	4				1	2	3	4
6	7	8	9	10	11	12		7	8	9	10	11	12	13		6	7	8	9	10	11	12		5	6	7	8	9	10	11
13	14	15	16	17	18	19		14	15	16	17	18	19	20		13	14	15	16	17	18	19		12	13	14	15	16	17	18
20	21	22	23	24	25	26		21	22	23	24	25	26	27		20	21	22	23	24	25	26		19	20	21	22	23	24	25
27	28	29						28	29	30	31					27	28	29	30	31				26	27	28	29	30		
MARCH							JUNE							SEPTEMBER							DECEMBER									
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S			
				1	2	3	4					1	2	3					1	2							1	2		
5	6	7	8	9	10	11		4	5	6	7	8	9	10		3	4	5	6	7	8	9		3	4	5	6	7	8	9
12	13	14	15	16	17	18		11	12	13	14	15	16	17		10	11	12	13	14	15	16		10	11	12	13	14	15	16
19	20	21	22	23	24	25		18	19	20	21	22	23	24		17	18	19	20	21	22	23		17	18	19	20	21	22	23
26	27	28	29	30	31			25	26	27	28	29	30			24	25	26	27	28	29	30		24	25	26	27	28	29	30
																								31						

1973

FEBRUARY							MAY							AUGUST							NOVEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1	2	3			1	2	3	4	5			1	2	3	4					1	2	3
4	5	6	7	8	9	10	6	7	8	9	10	11	12	5	6	7	8	9	10	11	4	5	6	7	8	9	10
11	12	13	14	15	16	17	13	14	15	16	17	18	19	12	13	14	15	16	17	18	11	12	13	14	15	16	17
18	19	20	21	22	23	24	20	21	22	23	24	25	26	19	20	21	22	23	24	25	18	19	20	21	22	23	24
25	26	27	28				27	28	29	30	31			26	27	28	29	30	31		25	26	27	28	29	30	

MARCH							JUNE							SEPTEMBER							DECEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1	2	3					1	2						1								1
4	5	6	7	8	9	10	3	4	5	6	7	8	9	2	3	4	5	6	7	8	2	3	4	5	6	7	8
11	12	13	14	15	16	17	10	11	12	13	14	15	16	9	10	11	12	13	14	15	9	10	11	12	13	14	15
18	19	20	21	22	23	24	17	18	19	20	21	22	23	16	17	18	19	20	21	22	16	17	18	19	20	21	22
25	26	27	28	29	30	31	24	25	26	27	28	29	30	23	24	25	26	27	28	29	23	24	25	26	27	28	29
														30							30	31					

BOARD OF GOVERNORS

ROBERT W. SCOTT, *Chairman*
ARCH T. ALLEN, *Acting Secretary*

IKE F. ANDREWS	Siler City
HOWARD C. BARNHILL	Charlotte
ANDREW A. BEST	Greenville
W. EARL BRITT	Fairmont
CLARK S. BROWN	Winston-Salem
VICTOR S. BRYANT	Durham
HUGH CANNON	Raleigh
JULIUS CHAMBERS	Charlotte
LENOX G. COOPER	Wilmington
HUGH DANIEL, JR.	Waynesville
WILLIAM A. DEES, JR.	Goldsboro
JACOB H. FROELICH, JR.	High Point
GEORGE WATTS HILL	Durham
WATTS HILL, JR.	Chapel Hill
MRS. HOWARD HOLDERNESS	Greensboro
J. P. HUSKINS	Statesville
WALLACE N. HYDE	Asheville
WILLIAM A. JOHNSON	Lillington
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REGINALD MCCOY	Laurinburg
AARON J. PREVOST	Hazelwood
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MACEO A. SLOAN	Durham
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NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY

JOHN S. STEWART, <i>Chairman</i>	Durham
CHARLES W. PHILLIPS, <i>Vice Chairman</i>	Greensboro
HOWARD C. BARNHILL	Charlotte
ANDREW BEST	Greenville
LACY CAPLE	Lexington
ROBERT H. FRAZIER	Greensboro
FRONTIS W. JOHNSTON	Davidson
DAVID W. MOREHEAD	Greensboro
L. L. RAY	Burlington
OTIS TILLMAN	High Point
W. B. WICKER	Greensboro

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JOHN ZEIGLER, B.S.	Business Manager
JESSE E. MARSHALL, B.S., M.S., Ed.D.	Dean of Student Affairs
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T. MAHAFFEY, B.S., M.B.A., Ph.D.	Administrative Assistant to the President
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HOWARD ROBINSON, B.S., M.S., Ph.D.	Director of Research Administration
GLORIA SCOTT, A.B., M.A., Ph.D.	Director of Institutional Research

ACADEMIC AFFAIRS

GLENN F. RANKIN, B.S., M.S., Ed.D.	Dean of Academic Affairs
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REGINALD AMORY, B.C.E., M.C.E., Ph.D.	Dean, School of Engineering
ARTHUR F. JACKSON, B.S., M.A., Ed.D.	Dean, School of Arts and Sciences
S. JOSEPH SHAW, B.S., M.A., Ph.D.	Dean, School of Education
ALBERT W. SPRUILL, B.S., M.S., Ed.D.	Dean, The Graduate School
HERBERT WATKINS, B.S., M.B.A., Ph.D.	Dean, School of Business
B. C. WEBB, B.S., M.S., Ph.D.	Dean, School of Agriculture
NAOMI W. WYNN, B.S., M.A.	Dean, School of Nursing
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WILLIAM H. GAMBLE, B.S.	Director of Admissions
RUDOLPH ARTIS, B.S., M.S., Ed.D.	Director of Registration and Records
B. C. CREWS, JR., A.B., M.L.S.	Acting Director of Library Services
COLONEL WILLIAM B. NEAL	Professor of Military Science
LT. COLONEL ROBERT O. THORNTON	Professor of Aerospace Studies

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WILLIAM GOODE, B.S.	Associate Dean of Student Affairs for Housing
LUCILLE PIGGOTT, B.S., M.Ed.	Associate Dean of Student Affairs for Student Organizations and Student Development
RUTH GORE, B.S., A.M.	Director of Counseling and Testing Services
VANCE E. GRAY, B.S., M.B.A.	Director of Student Financial Aid
BENNY MAYFIELD, B.S., M.Ed.	Assistant to the Dean of Student Affairs
W. I. MORRIS, B.S., M.A.	Director of Placement
CLEO MCCOY, B.A., B.S., B.D.	Director of Religious Activities
SULLIVAN WELBORNE, B.S., M.S.	Acting Director of Memorial Union and Director of Student Activities

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ANTHONY A. DUDLEY, B.S.	Chief Accountant
ROBERT HALL, B.S.	Internal Auditor
JAMES E. GARFIELD, B.S., M.S.	Director of Auxiliary Services
DORIS D. CANADA, B.S.	Personnel Officer

MAXINE D. DAVIS, B.S., M.S. *Purchasing Officer*
JONAH SMITH, Sr., B.S. *Bursar-Accountant*
RUBY W. JONES, B.S. *Administrator, Contracts and Grants*
MARVIN GRAEBER, B.S., M.S. *Associate Director of Physical Plant*

DEVELOPMENT

MARSHALL H. COLSTON, B.S., M.S.W. *Director of Planning and Development*
JOSEPH D. WILLIAMS, B.S., M.S. *Associate Director of Planning and
Development for Alumni Affairs*
RICHARD MOORE, B.S., M.S. *Director of Public Information*
CURETON JOHNSON, B.S., M.S. *Assistant Director of Public Information*

OFFICER EMERITUS

WARMOTH T. GIBBS, A.B., Ed.M., LL.D. *President Emeritus*

GENERAL INFORMATION



HISTORICAL STATEMENT

The Agricultural and Technical College was established as the "A. and T. College for the Colored Race" by an act of the General Assembly of North Carolina ratified March 9, 1891. The act read in part:

That the leading object of the institution shall be to teach practical agriculture and the mechanic arts and such branches of learning as relate thereto, not excluding academical and classical instruction.

The College began operation during the school year 1890-91, before the passage of the state law creating it. This curious circumstance arose out of the fact that the Morrill Act passed by Congress in 1890 earmarked the proportionate funds to be allocated in bi-racial school systems to the two races. The A. and M. College for the White Race was established by the State Legislature in 1889 and was ready to receive its share of funds provided by the Morrill Act in the Fall of 1890. Before the college could receive these funds, however, it was necessary to make provisions for Colored students. Accordingly, the Board of Trustees of the A. and M. College in Raleigh was empowered to make temporary arrangements for these students. A plan was worked out with Shaw University in Raleigh where the College operated as an annex to Shaw University during the years 1890-1891, 1891-1892, and 1892-1893.

The law of 1891 also provided that the College would be located in such city or town in the State as would make to the Board of Trustees a suitable proposition that would serve as an inducement for said location. A group of interested citizens in the city of Greensboro donated fourteen acres of land for a site and \$11,000 to aid in constructing buildings. This amount was supplemented by an appropriation of \$2,500 from the General Assembly. The first building was completed in 1893 and the College opened in Greensboro during the fall of that year.

In 1915 the name of the institution was changed to The Agricultural and Technical College of North Carolina by an Act of the State Legislature.

The scope of the college program has been enlarged to take care of new demands. The General Assembly authorized the institution to grant the Master of Science degree in education and certain other fields in 1939. The first Master's degree was awarded in 1941. The School of Nursing was established by an Act of the State Legislature in 1953 and the first class was graduated in 1957.

The General Assembly repeated previous acts describing the purpose of the College in 1957, and redefined its purpose as follows:

"The primary purpose of the College shall be to teach the Agricultural and Technical Arts and Sciences and such branches of learning as related thereto; the training of teachers, supervisors, and administrators for the public schools of the State, including the preparation of such teachers, supervisors and administrators for the Master's degree. Such other programs of a professional or occupational nature may be offered as shall be approved by the North Carolina Board of Higher Education, consistent with the appropriations made therefor."

In 1967 the General Assembly of North Carolina voted to elevate the College to the status of a Regional University effective July 1, 1967.

On October 30, 1971, the General Assembly ratified an Act to consolidate the Institutions of Higher Learning in North Carolina. Under the provisions of this Act, North Carolina Agricultural and Technical State University will become a constituent institution of The University of North Carolina effective July 1, 1972.

Six presidents have served the institution since it was founded in 1891. They are as follows: Dr. J. O. Crosby, (1892-1896), Dr. James B. Dudley, (1896-1925), Dr. F. D. Bluford, (1925-1955), Dr. Warmoth T. Gibbs, (1956-1960), Dr. Samuel DeWitt Proctor, (1960-1964), and Dr. Lewis C. Dowdy, who was elected President April 10, 1964.

LOCATION

North Carolina Agricultural and Technical State University is fully accredited by the Southern Association of Colleges and Schools. This coeducational institution occupies a unique campus nine blocks from the heart of metropolitan Greensboro, North Carolina. The University's urban location puts major shopping areas, theaters, churches and transportation depots within walking distance. This location is also an advantage to the many students who obtain part-time employment in the city's business district.

Students at A&T State University may take full advantage of Greensboro's outstanding cultural climate. The City has become known for its libraries, museum, art galleries and university and college campuses. Greensboro's central location in the state provides convenient access to other nearby points of interest.

A wide variety of entertainment and recreation is available on the campus and in facilities of the city. The four and one-half million dollar Greensboro Memorial Auditorium-Coliseum attracts outstanding athletic, entertainment and cultural events. Outstanding among these attractions are the annual Central Intercollegiate Athletic Association Basketball Tournament and a schedule of Atlantic Coast Conference and professional basketball games. The city also fields professional teams in baseball and hockey. The city has facilities available for ice skating, bowling, boating and fishing, horseback riding, tennis and golf.

THE PHYSICAL PLANT

The university campus comprises modern, fire resistant buildings, all thoroughly maintained for the highest level of efficiency, located on land holdings in excess of 181 acres.

Additional facilities procured in recent years include: The Lutheran College Property which contains several buildings and two tracts of land on Dudley Street, purchased from the Redevelopment Commission of Greensboro.

UNIVERSITY BUILDINGS

Dudley Memorial Building (Administration)
 F. D. Bluford Library
 Harrison Auditorium
 Charles Moore Gymnasium
 Coltrane Hall (Headquarters for N. C. Agricultural Extension Service)
 Memorial Union
 The Oaks (President's Residence)

CLASS ROOM AND LABORATORY BUILDINGS

Carver Hall	School of Agriculture
Cherry Hall	School of Engineering
Crosby Hall	School of Arts and Sciences
Hodgin Hall	School of Education and Arts & Sciences
Noble Hall	School of Nursing
Price Hall	Division of Industrial Education and Technology
Benbow Hall	Home Economics
Garrett House	Home Economics
Hines Hall	Chemistry

Sockwell Hall	Agricultural Technology
Ward Hall	Dairy Manufacturing
Reid Greenhouses	
Graham Hall	School of Engineering and Computer Science Center
Frazier Hall	Music-Art
Price Hall	Division of Industrial Education & Technology
Price Hall Annex	Child Development Laboratory
Campbell Hall	ROTC Headquarters
Barnes Hall	Biology
Merrick Hall	Business and Mathematics

RESIDENCE HALLS

Curtis Hall (148)	Cooper Hall (400)
Gibbs Hall (200)	Scott Hall (1010)
High Rise Dormitory (East) (194)	Senior Hall (200)
High Rise Dormitory (West) (208)	
Holland Hall (144)	
Morrison Hall (94)	
Vanstory Hall (200)	

Service Buildings

Murphy Hall	Cafeteria
Brown Hall	Cafeteria, Post Office, Student Financial Aid Office
Sebastian Infirmary	
Power Plant	
Laundry-Dry Cleaning Plant	

Other Facilities

College Farms—including 600 acres of land and modern farm buildings
 Athletic field—including three practice fields for football, quarter mile track, baseball diamond and field house.

INSTITUTIONAL MEMBERSHIP

North Carolina Agricultural & Technical State University is a fully accredited member of the SOUTHERN ASSOCIATION OF COLLEGES AND SCHOOLS, and holds institutional membership in the following associations:

- American Association of Colleges for Teacher Education
- American Association of Collegiate Registrars and Admission Officers
- National Association of State Universities and Land Grant Colleges
- American College Public Relations Association
- American Council on Education
- American Public Welfare Association
- American Library Association
- Association of American Colleges
- Association of Collegiate Deans and Registrars
- Association of Collegiate Schools of Architecture
- College Language Association
- National Association of Business Teacher Education

National Association of College and University Food Service
 National Commission on Accrediting
 National Institutional Teacher Placement Association
 National League for Nursing, Council of Member Agencies, Department of Baccalaureate and Higher Degree Programs
 North Carolina Association of Colleges and Universities
 North Carolina League for Nursing
 North Carolina Library Association
 Southeastern Library Association

Graduates of the University are eligible for membership in the American Association of University Women

The School of Engineering is accredited by the Engineer's Council on Professional Development

The School of Nursing is accredited by the National League for Nursing, Department of Baccalaureate and Higher Degree Programs

FERDINAND D. BLUFORD LIBRARY

The Ferdinand D. Bluford Library is housed in a modern airconditioned building located near the center of the main campus. The current holdings include 305,724 volumes and a collection of records, films, filmstrips and prints. The Library subscribes to 1,176 periodicals, newspapers and indexes. It is an officially designated depository for selected United States government publications and participates in established inter library loan programs.

Special facilities and services provided by the Library include an assembly room, carrels for faculty and graduate students, various types of microfilm and microfilm readers.

The Library schedule is as follows:

Monday - Thursday	8:00 a.m. - 12:00 M
Friday	8:00 a.m. - 6:00 p.m.
Saturday	9:00 a.m. - 5:00 p.m.
Sunday	2:00 p.m. - 12:00 M

The Clinton Taylor Art Gallery and the Teacher Education Materials Center are located on the ground floor of the Library.

THE AUDIOVISUAL CENTER

The Audiovisual Center is a resource pool of materials, services and facilities. It purports to assist in the improvement of instruction by providing means of facilitating the communication of ideas, attitudes and facts in the teaching-learning process. The Center is located on the first floor (Room 101) of Crosby Communications Building. The Audiovisual Center provides the following services for the campus:

- Information on Instructional Materials and Equipment from other Sources
- Projectionist for Audiovisual Showings
- Classroom and Preview Showings
- Assistance in the selection and preparation of Instructional Materials
- Consultation on problems relating to the location, selection, utilization, design and evaluation of instructional materials and equipment

CLOSED CIRCUIT TELEVISION

An important adjunct to the educational program of the University is the newly activated television facility. This closed-circuit installation is housed in the Crosby Communications Building. Programs may be originated in the studio, in six classrooms and in the Little Theater. Programs may be received from the studio or from "off the air" in 23 classrooms or seminars rooms. The modern cameras and control equipment provide the ability to produce special effects and program quality comparable to commercial stations.

COMPUTER SCIENCE CENTER

The Computer Science Center is located on the first floor of Graham Hall, the engineering annex. The Center provides three important kinds of service for the University. These include instruction, research and administrative service.

The staff helps with the preparation of computer programs. It provides instruction concerning the use of the equipment, serves as consultants to computer users conducting research, and supervises the operation of the Center.

The Center is equipped with a Control Data 3170 Computer System and supporting pieces of IBM unit record equipment.

LANGUAGE LABORATORY

An electronic, dial-access laboratory has been provided for students enrolled in Foreign Language, Speech, and Reading Courses. This facility provides positions from which students may dial prepared lessons, exercises or lecture. In addition, certain positions provide the opportunity to control remote tape recorders on which to record their own responses. Certain rooms are equipped with over-head speakers accessing both tape drives and record players. Although primarily designed for the departments mentioned, the facility is available to all departments of the University.

READING CENTER

The University Reading Center is located in Crosby Hall. It was established to provide assistance for students who need to improve their reading skill in order to experience greater academic success. English 102, Developmental Reading, is offered through the facilities to help students improve their reading efficiency and strengthen their communicative skills. Diagnostic and remedial services are available through the Center to University students. It also serves as a laboratory for teacher preparation.

COOPERATIVE EDUCATION

Cooperative Education is a carefully organized and supervised program of "Experiential Learning" in which the participating student enriches his education by alternating periods of classroom study with periods of work related to his academic major. It is OPTIONAL on the part of the student and is COUNSELING-CENTERED. The objective of the program is to enrich the Total Educational Experience of students involved.

INSTITUTE FOR RESEARCH IN HUMAN RESOURCES

The University has organized an Institute for Research in Human Resources. Its broad purpose is to investigate problems that exist for people who are culturally, economically,

educationally or socially disadvantaged. The Institute has been structured to bring together available resources and attributes from the University and the larger community for research, service and study. The interdisciplinary approach employed by the Institute allows social scientists, humanists and the natural scientists to place special emphasis upon achieving new approaches and new solutions to many human resource problems. The Institute is housed in Carver Hall.

TRANSPORTATION INSTITUTE

The Transportation Institute draws faculty, staff members and students from a number of different departments to create an interdisciplinary unit that conducts training and research programs in the field of transportation. It also serves as a resource for planners, social scientists, public officials, and community groups in helping them solve transportation problems.

In the Training Program, students can choose from a coordinated series of courses offered by the Departments of Architectural Engineering, Business Education, Economics and Political Science. Students are encouraged to seek a broad background which can be tailored to meet their individual needs.

The Research Program covers a wide range of areas, from investigating transportation needs of the poor to developing a transportation systems model. The programs are oriented towards both exploring various problem areas and providing students the opportunity to become knowledgeable in transportation analysis.

Activities of the Transportation Institute are not limited to students. The Institute is a regional center which offers seminars, workshops, and short courses designed to provide instruction in current techniques and transportation concepts. These programs are designed for individuals outside the University who have an interest in transportation.

OFFICE OF PLANNING AND DEVELOPMENT

The Office of Planning and Development is maintained by the University not only to assist with the overall institutional development, but also to promote its continual interest among alumni, parents, friends, foundations, corporations and other sectors of the national community. It encourages annual alumni giving, deferred giving and conducts special fund campaigns. The Office embraces the following areas of operation: Alumni Affairs, Public Information, Fund Raising, Publications, Public Relations, Legislative Relations, Industrial Liaison, Sports Publicity and special educational projects.

In addition, the Office aids in conducting the affairs of the A & T University Foundation, Inc., which has been established to assist in soliciting gifts from other than state coffers for such worthy purposes as unrestricted student scholarships, specialized scholarships for students in science, engineering and fine arts, faculty improvement, faculty chairs, research programs, an endowment fund, the art gallery, historical museum and capital funds.

The Office is conveniently located on the main floor of the Dudley Memorial Building.

FINANCIAL INFORMATION

STUDENT LOAN FUND

N. C. A. and T. State University Student Aid Fund was established by the Student Council of 1946-1947 to provide a source of revenue for loans to deserving students.

This fund is supported by the contributions from students, faculty members, and campus organizations. Any regular term students, duly registered, is eligible to apply for aid through this fund.

THE NATIONAL DEFENSE STUDENT LOAN PROGRAM

A. and T. State University participates in the National Defense Student Loan Program. This program was authorized by Public Law 85-864, the National Defense Education Act of 1958. It provides a loan fund from which undergraduates and graduate students may borrow on reasonable terms for the purpose of completing their higher education. A student must be a citizen of the United States, enrolled as a full-time or half-time undergraduate or graduate student in order to be eligible for a loan. Application forms and additional information may be obtained from the Financial Aid Officer, North Carolina A. & T. State University, Greensboro, North Carolina.

NORTH CAROLINA RURAL REHABILITATION CORPORATION STUDENT LOAN PROGRAM

Loans under this program are available to needy and worthy North Carolina farm boys and girls who plan to study agriculture or home economics. The loans bear interest at the rate of four percent per annum. Application forms and additional information may be obtained from North Carolina Rural Rehabilitation Corporation, Post Office Box 2403, Raleigh, North Carolina.

REQUIRED FEES, DEPOSITS AND CHARGES

Total semester fees and charges are due and payable in full on or before registration of each semester. However, an alternate payment plan listed below is available to BOARDING or BOARDING AND LODGING students only. Mailed in payments shall be postmarked not later than August 4, 1972 for the Fall Semester and December 15, 1972 for the Spring Semester. Remittances of money for expense should be made by certified check, bank draft, postal money order, or cash if paid in person and made payable to North Carolina A & T State University. All such payments should be addressed to Cashier's Office, N. C. A & T State University, Greensboro, N. C. 27411.

An advance deposit fee of \$100.00 is required of all *new* and *transfer students* and said sum is to be paid within three (3) weeks of the mailing by the University of the notice of acceptance. The deposit shall be applied against the tuition and fees upon entrance. If, after remitting the deposit, a decision is made not to attend the University, the deposit is forfeited if notice of the intent is not given by May 1 in the case of application for the Fall term, or at least one month prior to the beginning of the term, in the case of application for the Spring term.

An advance deposit fee of \$50.00 is required of all *returning* or *continuing* students and said sum is to be paid during the last regular term of the academic year preceding the year for which the deposit is being paid in the case of continuing students and within three (3) weeks of the mailing by the University of the permit to Register in the case of returning or re-admitted students. The deposit shall be applied against the tuition and fees upon entrance. The deposit is forfeited if a decision is made not to return to or enter the University and notice of the intent is not given within Thirty (30) days after the last day of the term in which the deposit was made.

A non-refundable application fee of \$10.00 is required of all new and transfer students.

	<i>Students Living Off Campus (Day Student)</i>	<i>Students Living Off Campus But Taking Meals On Campus (Boarding Only Student)</i>	<i>Students Living On Campus and Taking Meals On Campus (Boarding and Lodging Student)</i>
North Carolina Students:			
Fall and Spring Semester Each	\$ 262.25	\$ 474.75	\$ 644.25
Out-of-State Students:			
Fall and Spring Semester Each	1,036.75	1,249.25	1,418.75

ALTERNATE PAYMENT PLAN FOR BOARDING OR
BOARDING AND LODGING STUDENTS ONLY

	<i>Students Living Off Campus But Taking Meals On Campus (Boarding Only Student)</i>	<i>Students Living On Campus and Taking Meals on Campus (Boarding and Lodging Student)</i>		
	N. C. Student	Out-of-State Student	N. C. Student	Out-of-State Student
Payment Due Each Registration.....	\$339.75	\$1,114.25	\$392.25	\$1,166.75
Second Installment (September 20, 1972)	45.00	45.00	84.00	84.00
Third Installment (October 20, 1972).....	45.00	45.00	84.00	84.00
Fourth Installment (November 20, 1972).....	45.00	45.00	84.00	84.00
Totals	<u>\$474.75</u>	<u>\$1,249.25</u>	<u>\$644.25</u>	<u>\$1,418.75</u>

REGULAR SESSION PART-TIME STUDENT FEE RATES

N. C. Students, <i>Per Semester Hour</i> (Undergraduate)	\$ 21.85
Out-of-State Students, <i>Per Semester Hour</i> (Undergraduate)	86.40
N. C. Students, <i>Per Semester Hour</i> (Graduate)	14.45
Out-of-State Students, <i>Per Semester Hour</i> (Graduate)	79.00

SUMMER SCHOOL STUDENT FEE RATES

Tuition (Per Semester Hour)	\$ 8.40
Out-of-State Fees (Per Semester Hour)	16.60
Registration Fees (Per Semester hour)60
Activity Fee (Per Semester Hour)20
Book Rental Fee (Per Semester Hour)	1.50
Health Service Fee (Per Semester Hour)50
Student Union Fee (Per Semester Hour)	1.00
Board Rate (Per Week with Meal Tickets)	13.50
Room Rent with Linen Rental (Per Week)	7.00

DETAIL OF FEES, DEPOSITS AND CHARGES

Required Fees—Per Year:

Tuition, N. C. Student	\$ 251.00
Tuition, Out-of-State Student	1,549.00
Registration Fees	15.00
Activity Fees	86.50

Book Rental Fees	38.00
Health Service Fee	50.00
Student Union Fee	44.00
Reserve for Auxiliary Service Operations	40.00
Board and Room Rates:	
Board	\$ 425.00
Room Rent	320.00
Linen Rental	16.00
Linen Deposit (Refundable)	3.00
Incidental Fees and Deposits:	
Admission Application Deposit (No refund—no credit on account)	10.00
Admission Reservation Deposit (No refund—credit applied to account):	
New or Transfer Students	100.00
Returning or Continuing Students	50.00
Ambulance Service	20.00
Day Student Infirmary Meal Charges (Per Meal)60
Dormitory Key Deposit (Refundable)	1.00
Driver Education Laboratory Fee Per Course:	
Regular Session or Summer School	10.00
Graduation Fees, Regalia Renting and Diploma:	
Trades	11.00
Bachelors	15.00
Masters	26.00
I. D. Card Replacement	3.00
Late Registration Fee	5.00
Masters Thesis Binding Fee - Three Copies	20.00
Practice Teaching Fee (Other than Vocational Agriculture)	35.00
ROTC Uniform Deposit	10.00
Engineering Inspection Tour Fee	25.00
Special Examination Fees Varies \$5 to \$15 (Average)	10.00
Transcript of Records (after first one)	1.00
Activity Book Replacement Fee	4.00
Meal Sticker Replacement Fee	10.00

AUDITORS

Auditing of courses is open to a qualified person, without credit, upon the payment of all regular applicable fees. Currently enrolled full-time students may audit courses without additional charge. An auditor is not required to participate in class discussion, prepare assignments or take examinations.

REFUNDS

Refunds upon official withdrawal of a student from the University will be made less any amount due the University as follows:

1. Lodging: Days room not occupied at the rate of \$1.25 per day from time of official withdrawal. (No refund on linen rental.)
2. Board: Refund computed at the rate of \$1.70 per day from the official date of withdrawal.
3. Tuition: Registration, Health, Book Rental, Student Union and Activity fees, Reserve for Auxiliary Service Operations:
 - 90 percent when withdrawal is within one week of registration date.
 - 80 percent when withdrawal is within two weeks of registration date.
 - 75 percent when withdrawal is within three weeks of registration date.
 - 60 percent when withdrawal is within four weeks of registration date.
 - 45 percent when withdrawal is within five weeks of registration date.
 - 35 percent when withdrawal is within six weeks of registration date.
 - 20 percent when withdrawal is within seven weeks of registration date.
 - 15 percent when withdrawal is within eight weeks of registration date.
 - None when withdrawal is after eight weeks.

WITHDRAWAL FROM COURSES

In order to receive financial credit for withdrawal from courses, a student must withdraw from the course(s) within the official "add" period.

SPECIAL NOTICES AND EXPLANATIONS

The University reserves the right to increase or decrease all fees and charges as well as add or delete items of expense without advance notice as circumstances, in the judgment of the Administration may require.

Room and board rates are based on the average cost of operations for the entire school year which includes provision for services only during the scheduled operational days. Allowances have, therefore, been made for holidays when the facilities are closed.

With the exception of special cases in which permission has been obtained from the Dean of Students, students from outside the city of Greensboro are required to reside in the University dormitories and take board in the University cafeterias.

Student's property in dormitories and other University buildings is at the sole risk of the owner and the University is not responsible for loss or theft of or damage to such property arising from any cause.

Students are required to pay for any loss of or damage to University property at replacement cost due to abuse, negligence or malicious action, in addition to being subject to disciplinary action.

Book rental system operation: Books are issued only for courses listed on the students approved schedule. Reference books, workbooks and supplies are not provided. Proof of official class changes must be presented upon reissue request for other books together with the return of texts issued for courses dropped. All rental books must be returned to the Bookstore on or before the last day of official scheduled examination to establish eligibility for the continued rental of books for a succeeding semester. Students failing to return books within two days following the close of the semester of issue will be charged the full replacement cost of each book not returned. Students withdrawing during a semester must return all rental books on the day of official withdrawal. Provision for rental text purchases can be made directly at the Bookstore.

Personal spending money should be sent directly to and made payable to the student in the form of money orders or certified checks. The University cannot cash personal checks for students in any amount.

Diplomas and transcripts of records are withheld until the student has paid in full all fees and charges due the University. Further, a student in debt to the University in any amount will not be admitted to final examinations in any course, nor will he be permitted to register for any subsequent semester until his obligations are paid. Failure to make scheduled payments when due will cause the student to be dropped from school for nonpayment of fees.

SPECIAL NOTICE TO VETERANS

Veterans attending school under the provisions of Public Law 89-358 receive a monthly subsistence allowance from the Veteran's Administration. Veterans, therefore, are responsible for the meeting of all their expenses.

Veterans attending school under the provisions of Public Law 894 (Disabled Veterans) receive a monthly subsistence allowance from the Veterans Administration and in addition to this, the Veterans Administration pays directly to the school the cost of the veteran's tuition and required fees. A disabled veteran is, therefore, responsible for his room and board payments and should be prepared to pay the appropriate room and board payment at registration in addition to meeting the scheduled installments for room and board.

ACADEMIC INFORMATION AND REGULATIONS**Admission Policy of the University**

Qualified applicants are admitted to the University without regard to race, religion, creed or national origin.

Admission

A student who wishes to enter North Carolina Agricultural and Technical State University for the first time will be considered for admission if:

1. The student has graduated from high school with not less than 16 units of credit.
2. The student is transferring from another accredited college or university, is in good standing and has a cumulative average equivalent to "C" or above.
3. The student has graduated from an accredited college or university to enter the Graduate School.

Procedure for New Students

1. Write to the Director of Admissions for an application blank for admission to the University. Fill it out properly and return it to the Office of Admissions.
2. Arrange for the transcript of academic records from high school and/or college or university previously attended to be sent directly to the Director of Admissions.
3. All candidates for admission to the freshman class must take the Scholastic Aptitude Test prior to admission. This test is administered by the College Entrance Examination Board several times each year at centers throughout the United States and many foreign countries. Testing dates are regularly scheduled in November, December, January, March, May, and July. Applicants should obtain Bulletins of Information, including application blanks, directly from their high school principals or guidance counselors. If these are not available in the school, applicants should write directly to the College Entrance Examination Board, Box 592, Princeton, New Jersey, for a list of testing dates and centers so that assignments may be made to the center nearest to the applicant's residence.
4. After the completed application form, transcripts, and test results are received, they will be evaluated, and if approved, the student will receive a letter of admission and a permit to register. If the applicant for admission is not approved, the applicant will be notified.
5. Each candidate for the Freshman Class, who is scheduled to reside on campus, is expected to arrive on the campus the day preceding the date designated on the college calendar for freshman orientation. All freshmen should be present by 8:00 a.m. on the first day. The permit to register furnished beforehand by the Director of Admissions indicating the School or Department in which the applicant wishes to register must be ready for presentation to proper authorities. The dates indicated in the college calendar for freshman orientation and registration as well as those for upperclassmen must be strictly observed. Those seeking registration after the scheduled date must pay a late registration fee of \$5.00.

ADMISSION REQUIREMENTS

Entrance Units

High School graduates should present the following entrance credits, distributed as shown below:

<i>Subject</i>	<i>Number of Units</i>
English	4
*Mathematics (including one unit of Algebra)	2
Social Studies (Preferably U. S. History)	1
Natural Science	1
Electives	8
<hr/>	
Total	16

The elective units may be selected from any other high school courses. However, students may not present more than two (2) units in activity courses, such as music and physical education, and not more than four (4) units in vocational courses.

*Students who plan to major in science or business must have one unit of algebra and one unit of plane geometry.

*Students who plan to major in engineering, mathematics, and physics must have two units of algebra, one unit of plane geometry, and one-half unit of trigonometry.

Conditional Admission

Students who present sixteen (16) acceptable entrance units but do not meet the entrance requirements in mathematics listed for their curricular must take special non-credit courses to meet these deficiencies. The removal of deficiencies must begin immediately upon enrollment in the first year of study.

Transfer Students

Applications from transfer students cannot be considered until all credentials are received from the high school and all other institutions previously attended. In addition, there must be a statement of good standing and honorable dismissal from these institutions.

Previous college records must show a cumulative average of "C" or above. Even with a cumulative average of "C" or above, no course is accepted in which a grade below "C" was originally earned.

Accepted courses are recorded to the student's credit, but grade points are not calculated on the transferred courses. The grade points for a transfer student are calculated only on the courses taken here. A student must complete more than half of his required courses at North Carolina A & T State University in order to be considered for honors when he graduates.

Special Students

In exceptional cases, an applicant of mature years, with special training along particular lines or of long experience in special fields of knowledge, may be admitted to the college to pursue a non-degree program or to study certain subjects as special students. Even though they do not satisfy regular entrance requirements, such persons must submit evidence of ability to profit from such a program and must do a passing grade of work or forfeit the privilege accorded them. These persons must:

1. Request of The Director of Admissions an application form, fill it in and return it with:
 - (A) Records of previous educational experiences.
 - (B) Other documentary evidence of ability to pursue the courses desired.
 - (C) A statement of the applicant's objectives or purposes in pursuing studies chosen.

Visiting Student

A student regularly enrolled in another accredited college or university, may enroll at A. and T. State University for one or more courses during a regular term. Such special enrollment must be approved by the parent institution and A. and T. State University.

Filing of Credentials

Applicants should take the proper steps to see that their credentials, (transcripts, etc.), are sent to the Director of Admissions as early as possible, preferably not less than thirty (30) days before the beginning of the semester in which they plan to enroll.

Re-Admission of Former Students

All students who withdraw from the University must obtain a permit to register before resuming their studies at the University. The request for a permit must be received by the Office of Registration and Records at least 30 days prior to the beginning of the semester in which the student plans to register. When requesting a permit, students should include their student number, major, last term in attendance and their permanent address.

Former students who have been dismissed from the University for failure to meet the scholastic eligibility requirements may appeal to the Committee on Admissions and Retention for a review of their case. The appeal should be addressed to the Committee in care of the Dean of Academic Affairs.

These persons should not present themselves for re-enrollment until they have received a reply from the Committee. Appeals should reach the Committee at least sixty (60) days prior to the beginning of the term in which the person expects to register.

Former students whose attendance has been interrupted by the University for disciplinary reasons must apply to the Dean of Student Affairs for a review of their case for possible re-admission.

Courses of Study

Students should refer to the requirements of their respective departments and schools about their programs of study and confer with their advisers whenever problems arise. The student is expected to follow the program outlined as close as possible. This is very important during the first two years when he is satisfying basic degree requirements and prerequisites for advanced work.

Preregistration

Preregistration is a time designated each semester to allow the student and his or her adviser to review the student's records and plan a program for the next semester.

The student has an opportunity to discuss academic problems with the adviser. Preregistration helps to insure that the courses requested on the preregistered schedule will be available to the students the following semester.

Students who are enrolled in the University during the preregistration period are expected to preregister.

Official Registration

In order for a student to get credit for a course, he must be properly registered in that course. This means that the student must have gone through the registration procedures as outlined by the University. Further, the student must have filed with the office of Registration and Records the required class schedule cards and other basic data cards.

Late Registration

Students are expected to complete enrollment (including the payment of all required fees) on the dates listed on the University Calendar. The payment of fees is part of the registration process. No student is eligible to attend classes until the required fees have been paid.

Students who fail to complete registration during the scheduled dates will be required to pay a late registration fee of \$5.00.

Auditing a Course

Regular students may audit a course upon the written approval of the instructor and his or her faculty adviser. They must register officially for the course and pay an audit fee to the University Cashier.

Attendance, preparation, and participation in the classroom discussion and laboratory exercises shall be at the discretion of the instructor.

Auditors are not required to take examinations and tests and they receive no credit. An auditor may not change his registration from audit to credit or from credit to audit after the date for adding courses shown in the University Calendar.

Course Load

The normal course load is fifteen or sixteen (15 or 16) credit hours. A fulltime undergraduate student is required to carry a minimum of twelve (12) credit hours. The maximum course load for an undergraduate student is twenty-one (21) hours. This includes physical education and non-credit courses.

Repetition of Courses

A student who has received a failing grade in a required course at this University must repeat and pass the course unless the Dean of the School authorizes a substitute course. A course which is pre-requisite to another in a sequence must be passed before the student can take the next course in the series. When a course is repeated and passed, the higher grade will count toward meeting the course and degree requirements.

A student who has received a passing grade in any course at this University may repeat the course a second time for credit at his option. When the course is repeated the second grade earned by the student will count toward meeting the course degree requirements.

All grades earned by a student, including "F's", are part of his official academic record and will appear on his transcript.

Unit of Credit

The unit of credit is the semester hour which represents a subject pursued one period weekly for one semester of approximately sixteen (16) periods for one term. For example, a course valued at three semester hours meets for three periods weekly for one semester.

(Grading System)

Grades are assigned and recorded as follows:

<i>Grade</i>	<i>Description</i>	<i>Grade Points</i>
A	Excellent	4
B	Good	3
C	Average	2
D	Below average, but passing	1
F	Failure	0
I	Incomplete	
W	Withdrew	
S	Satisfactory (non-credit courses)	
U	Unsatisfactory (non-credit courses)	

Students are expected to earn and maintain a general average which will permit them to make progress toward graduation.

The following are minimum grade point averages required to permit a student to advance to the next classification: sophomore, 1.50; junior, 1.70; senior, 1.90.

The School Deans or Division Directors and department heads will review the academic records of students whose averages fall below these standards and recommend probation or suspension for students in this category.

A student who has been suspended initially from the University because a poor scholarship may return on probation after the expiration of one semester. A student readmitted after being suspended for poor scholarship must earn an average of 2.00 or above each semester in order to remain eligible to continue. If he fails to attain the minimum average required, he will be dismissed permanently.

Final grade reports are issued to parents and students at the end of each semester.

Grade Points

Grade points are computed by multiplying the number of semester hour credits by 4 for courses in which a grade of A is earned; by 3 for a grade of B; by 2 for a grade of C; by 1 for a grade of D. No grade points are given for a grade of F.

Grade Point Ratio

The grade point ratio is obtained by dividing the total number of grade points earned by the total number of semester hours completed.

Course Numbers and Classification

Each course bears a distinguishing number which identifies it within the department and indicates, broadly, its level. The numbering system is as follows:

100 - 399, lower level courses primarily for freshmen and sophomores

400 - 599, upper level courses primarily for juniors and seniors

600 - 699, courses for undergraduate and graduate students

700 - 899, courses for graduate students and appropriate professional students special programs

CLASSIFICATION OF STUDENTS

(Freshmen)

To be classified as a freshman, a student must have met the minimum standards for admission to A. and T. State University. All entering freshmen will be required to take a placement test in reading. Students will be assigned to the Reading Classes on the bases of their performance on the Reading Test.

(Sophomore)

To be classified as a sophomore, a student must have completed a minimum of 32 semester hours of work open to freshmen and must have earned at least a 1.50 average.

(Junior)

To be classified as a junior, a student must have completed 64 semester hours of work required of sophomores, with at least a 1.70 average. No student will receive junior classification until all required freshman and sophomore courses have been completed.

(Senior)

To be classified as a senior, a student must have completed at least 96 semester hours of required and major work, with at least a 1.90 average. For graduation, a student must have an overall average of 2.00.

Changes in Schedules

A change in a student's program may be made with the consent of his instructor and department chairman. However, if a student's schedule is changed after the designated period for adding and/or dropping courses, the consent of the School Dean is required.

The student must obtain and properly execute the Change of Schedule Form and the necessary schedule cards. These materials are obtained from the Office of Registration and Records and should be returned to that office.

Changing Schools

Students may transfer from one School of the University to another with the written approval and acceptance of the Deans of the Schools involved. The proper forms on which to apply for such a change are to be obtained from the Office of the Registrar and executed at least six weeks prior to the beginning of the semester in which the student plans to transfer.

WITHDRAWAL FROM THE UNIVERSITY

A student who wishes, or is asked to leave the University at any time during the semester shall execute and file official withdrawal forms. These forms may be obtained from the Office of the Dean of Student Affairs. They should be completed and executed in quadruplicate (quintuplicate for veterans), and taken to the Cashier's Office. For failure to execute these forms, a student incurs the penalty of receiving an "F" for each course in which he is enrolled that semester.

Students who withdraw from the University within 15 calendar days of the beginning of the final examination period for the semester shall receive grades based upon their performance in classes up to the date of their withdrawal.

INCOMPLETES

Students are expected to complete all requirements of a particular course during the semester in which they are registered. However, if at the end of the semester, a small portion of the work remains unfinished and should be deferred because of the prolonged illness of a student or because of some other serious circumstances beyond the control of the student, an "I" may be submitted.

An "I" for a prolonged illness may be submitted only after the written approval of the Dean of Students has been secured. An "I" for other causes may be submitted only with the approval of the Dean of the School.

Along the recording of the incomplete grade, the instructor must also file with the head of the department, the student's average grade and a written description of the work which must be completed before the incomplete is removed.

(Procedure for the Removal of an Incomplete)

An incomplete grade must be removed within SIX WEEKS after the beginning of the student's next semester in college. If the student has not removed the incomplete within the time specified, the instructor will submit a grade of "F".

Semester Examinations

A final examination will be required as a part of every course. An examination schedule showing time and place of meeting of each course and section will be published each semester. Schedules so published will be followed without exception. Any changes in the examination schedule must be approved by the Dean of Academic Affairs.

Honor Roll

To encourage scholarship, the University publishes an Honor Roll at the end of each semester. Regular students whose average grade in all courses is "B" shall be eligible for the Honor Roll.

CLASS ATTENDANCE

Regular and punctual class attendance is the responsibility of the individual student. Moreover, the student is expected to have sufficient maturity to assume the responsibility for regular attendance and to accept the consequences of failure to attend.

The non-compulsory class attendance policy places responsibility on the student and the instructor.

Student's Responsibility

1. The student is responsible for all material covered in each course for which he is registered. Absence from class does not relieve him of this responsibility.
2. The student is expected to be present for laboratory periods, scheduled examinations, and other activities that may require special preparation.
3. The student is responsible for initiating any request to make up an examination, a laboratory exercise or other work missed because of a class absence. If the instructor requests a statement concerning the reason for the absence, the student should obtain it from the appropriate officer (eg. the University Physician, the Dean of Student Affairs).
4. The student is expected to report to each class at the beginning of the term with a validated schedule and a class admission card.

Instructor's Responsibility

1. The instructor is responsible for explaining to the class any specific expectations concerning attendance at the beginning of the term.
2. The instructor is responsible for providing the student with a schedule of the examinations and other class requirements that will provide a basis for evaluating student performance.
3. The instructor is responsible for maintaining a record of the attendance of the students in his class.
4. The instructor is expected to warn the student when his academic progress is adversely affected by excessive absence from class.

DEGREE PROGRAMS

Students who complete one of the four or five year courses of study will be awarded the degree of Bachelor of Science.

Those graduating from a four-year curriculum in the School of Agriculture shall be entitled to the Bachelor of Science degree in Agricultural Education, Agricultural Science, Agricultural Technology, Agricultural Economics, Home Economics Education, Clothing and Textiles, Foods and Nutrition, Institution Management or Child Development.

Those graduating from a four-year curriculum in the School of Arts and Sciences shall be entitled to the Bachelor of Science degree in Art, English, Foreign Languages, Music, Biology, Chemistry, Mathematics, Physics, Economics, History, Political Science, or Sociology.

Those graduating from a four-year curriculum in the School of Education shall be entitled to the Bachelor of Science degree in Health and Physical Education, Psychology, Industrial Arts Education, Industrial Technical Education or Vocational Industrial Education.

Teaching majors are offered in the following areas: Art, Biology, Chemistry, English, French, Mathematics, Music, Physics, History, Social Studies, Agricultural Education, Business Education or Home Economics Education. These degree programs are offered in cooperation with the School of Arts and Sciences, the School of Agriculture and the Division of Business Administration.

Those graduating from a four or five year curriculum in the School of Engineering shall be entitled to the Bachelor of Science degree in Architectural Engineering*, Electrical Engineering, Mechanical Engineering, Engineering Mathematics or Engineering Physics.

Those graduating from a four-year curriculum in the School of Business shall be entitled to the Bachelor of Science degree in Accounting, Business Administration or Business Education.

Those graduating from a four-year curriculum in the School of Nursing shall be entitled to the Bachelor of Science degree in Nursing.

Core Requirements

The University Senate has approved the principle of greater flexibility in the course offerings that can be taken to satisfy the core requirements of the University. The areas in the core and the minimum semester hour requirements are as follows:

<i>Area</i>	<i>Minimum Number of Semester Hours Required</i>	<i>Suggested Courses</i>
English	8	*English 100, 101
Social Science	6	History 100, 101
Natural Science	6	Biological Science 100 Physical Science 100 Botany 140 Zoology 160 Chemistry 101, 102
Humanities	6	Humanities 200, 201
Mathematics	6	Mathematics 101, 102
Health or Physical Education	2	

* Five year program

* Required Course

GENERAL REQUIREMENTS FOR GRADUATION

A candidate for a degree from North Carolina Agricultural and Technical State University must satisfy the following requirements:

1. Choose a specific curriculum leading to a degree in one of the schools and complete the requirements of this curriculum.
2. Complete a minimum of 124 semester hours excluding deficiency courses and remedial work for the Bachelor of Science degree.
3. Complete the core requirements of the University in English, Mathematics, Natural Science, Social Science, Humanities and Health or Physical Education for the Bachelor of Science degree.
4. Earn an average of two (2) grade points for every semester hour undertaken including hours passed or failed. After completing the number of credit hours required for graduation, if the student is deficient in grade points, he must take additional courses that have been approved by his academic dean to secure these points. The student must also obtain an average of 2.0 or more in his major field.
5. Complete a minimum of three semesters as a full time student in residence at the University. At least one half of the student's credits in his major field must be earned here.
6. Take the Graduate Record Examination and/or the National Teachers Examination if applicable to his program.
7. Clear all academic conditions by the end of the semester preceding graduation.
8. Pay all University bills and fees.
9. File an application for graduation with the Office of Registrar three months prior to the expected date of graduation.

GRADUATION WITH HONORS

Graduation honors are awarded candidates who complete all requirements for graduation in accordance with the following stipulations: (1) Those who maintain a general average within the range of 3.00 to 3.24 will receive CUM LAUDE, (2) those who maintain a general average within the range from 3.25 to 3.49 will receive MAGNA CUM LAUDE, and (3) those who maintain a general average within the range of 3.50 to 4.00 will receive SUMMA CUM LAUDE. Publication of honors and scholarships is made at graduation and in the University Catalog.

GRADUATION UNDER A GIVEN CATALOGUE

A student may expect to earn a degree in accordance with the requirements of the curriculum outlined in the catalogue in force when he first entered the University provided the courses are being offered. Moreover, he must complete these requirements within six years. On the other hand, he may graduate under any subsequent catalogue published while he is a student. If a student elects to meet the requirements of a catalogue other than the one in force at the time of his original entrance he must meet all requirements of the catalogue he elects.

Obtaining Transcripts

A transcript is furnished at the *written* request of the student. The student must remit one dollar per transcript in the form of a postal money order or certified check.

RESIDENCE STATUS FOR TUITION PAYMENT

1. *General:* The tuition charge for legal residents of North Carolina is less than for nonresidents. To qualify for in-state tuition, a legal resident must have maintained his domicile in North Carolina for at least the twelve months next preceding the date of first enrollment or re-enrollment in an institution of higher education in this state. Student status in an institution of higher education in this state shall not constitute eligibility for residence to qualify said student for in-state tuition.
2. *Minors:* A minor is any person who has not reached the age of eighteen years. The legal residence of a person under eighteen years of age at the time of his first enrollment in an institution of higher education in this state is that of his parents, surviving parent, or legal guardian. In cases where parents are divorced or legally separated, the legal residence of the father will control unless custody of the minor has been awarded by court to the mother or to a legal guardian other than a parent. No claim of residence in North Carolina based upon residence of a guardian in North Carolina will be considered if either parent is living unless the action of the court appointing the guardian antedates the student's first enrollment in a North Carolina institution of higher education by at least twelve months.
3. *Adults:* An adult is any person who has reached the age of eighteen years. Persons, eighteen or more years of age at the time of first enrollment in an institution of higher education, are responsible for establishing their own domicile. Persons reaching the age of eighteen, whose parents are and have been domiciled in North Carolina for at least the preceding twelve months, retain North Carolina residence for tuition payment purposes until domicile in North Carolina is abandoned. If North Carolina residence is abandoned by an adult, maintenance of North Carolina domicile for twelve months as a non-student is required to regain in-state status for tuition payment purposes.
4. *Married Students:* The legal residence of a wife follows that of her husband, except that a woman currently enrolled as an in-state student in an institution of higher education may continue as a resident even though she marries a nonresident. If the husband is a nonresident and separation or divorce occurs, the woman may qualify for in-state tuition after establishing her domicile in North Carolina for at least twelve months as a non-student.
5. *Military Personnel:* No person shall lose his in-state resident status by serving in the Armed Forces outside of the State of North Carolina. A member of the Armed Forces may obtain in-state residence status for himself, his spouse, or his children after maintaining his domicile in North Carolina for at least the twelve months next preceding his or their enrollment or re-enrollment in an institution of higher education in this state.
6. *Aliens:* Aliens lawfully admitted to the United States for permanent residence may establish North Carolina residence in the same manner as any other nonresident.
7. *Property and Taxes:* Ownership of property in or payment of taxes to the State of North Carolina apart from legal residence will not qualify one for the in-state tuition rate.
8. *Change of Status:* The residence status of any student is determined as of the time of his first enrollment in an institution of higher education in North Carolina except:
 - (a) in the case of a nonresident student at the time of first enrollment who has subsequently maintained domicile as a non-student for at least twelve months and
 - (b) in the case of a resident who abandons his legal residence in North Carolina.In either case, the appropriate tuition rate will become effective at the beginning of the first subsequent term enrolled.

9. *Responsibility of Student:* Any student or prospective student in doubt concerning his residence status must bear the responsibility for securing a ruling by stating his case in writing to the admissions officer. The student who, due to subsequent events, becomes eligible for a change in classification, whether from out-of-state to in-state or the reverse, has the responsibility of immediately informing the Office of Admissions of this circumstance in writing. Failure to give complete and correct information regarding residence constitutes grounds for disciplinary action.

STUDENT LIFE



STUDENT LIFE

STUDENT PERSONNEL SERVICES

The broad objective of the program of Student Personnel Services is to aid the student in developing the attitudes, understandings, insights and the skills which will enable him to express himself as a socially competent person. The program places special emphasis on campus relationships and experiences which complement formal instruction.

More specifically the program of Student Personnel Services is conceived as a continuing exercise of identifying and remedying the daily life problems of the student. Accordingly, very definite efforts are made:

1. To help the student to become better acquainted with himself and the various problems confronting him.
2. To help the student to develop the ability to make satisfactory choices and adjustments.
3. To aid the student in making desirable adjustments in group relationships.
4. To provide cultural and social experiences which will help the student to develop an appreciation for the best in his culture.
5. To promote the physical, mental, moral and spiritual development of the student.

A number of college officials, faculty, and staff members are responsible for various phases of the program of Student Personnel Services. These include the Dean of Student Affairs, Associate Deans, the Director of Counseling and Testing Services, Food Services, Religious Activities, Housing, Health Services, the Director of Placement Services, University Union, the Advisor to Foreign Students, faculty advisors, and other individuals and agencies.

GUIDANCE AND COUNSELING SERVICES

Provision is made for counseling, testing, and guiding all students through the Counseling and Testing Office. It is located on the ground floor of Dudley Building.

The Counseling and Testing Office conducts a testing program for all freshmen. The results of this program are used to assist freshmen in the planning of their educational and vocational careers. The Office conducts other testing programs that are required or desired by departments of the University, also. In addition to these duties, the Office of Counseling and Testing cooperates with the Director of Placement in the placement of graduates.

HEALTH SERVICES

The University maintains an Infirmary in which it conducts a Health Service Program for students. The purposes of the health program are to safe-guard the health of the students, to promote health habits among them, and to protect and improve the health environment of the University community.

The Health Service Center maintains a staff of doctors, dentists, and nurses who are qualified to give professional attention to the health problems of students. The basic components of the health service program are as follows:

1. Medical Services:

The University maintains a Director of the Health Services who is the University Physician. The University Physician is in attendance in the infirmary daily—morning and evening—and is “on call” for any emergency situations.

2. Dental Services:

A dentist is in attendance weekly—Tuesday mornings and Thursday afternoons.

3. Nursing Services:

Registered nurses, under the direction of a head nurse, are in attendance daily on a twenty-four hour basis.

4. Follow-up and Consultation Services:

Follow-up services are given, and referrals to specialists are made upon recommendation of the University Physician.

5. Physical Examinations:

a. Athletes, nursing students, advanced ROTC cadets and other special groups of students are given complete physical examinations at the Student Health Center each semester or whenever necessary.

b. All freshmen and transfer students are required to secure a complete physical examination, a blood test and a chest X-ray and send the examination reports to the Director of Health Services before they are admitted to the college. The blood test and chest X-ray reports must be secured within 60 days prior to the date of enrollment. Follow-up examinations are made at the Health Center when necessary.

HOUSING

The residence halls provide opportunities for personal, social, and intellectual companionship as well as experiences in group living. Each residence hall is organized and it conducts programs for the development of the student.

Housing facilities for women are provided in Cooper, Gibbs, Holland, Morrison, Vanstory, and High Rise. Men are housed in Curtis, Scott, and Senior Hall.

Rooms are furnished with twin beds, dressers, study tables, and straight chairs. Each student who has been approved for living in one of the residence halls should bring his blankets. Bed linen will be furnished and is included in lodging fees.

All students, except those who are Greensboro residents or those who commute daily from nearby communities, are required to live in one of the residence halls as long as space is available, unless given permission to live elsewhere by the Dean of Student Affairs. The University reserves the right to approve all off-campus housing.

The University policy on required residence for undergraduate students is as follows:

- A. Students who enter the University as FRESHMEN will reside in University Housing through their first two academic years of enrollment.
- B. Students who enter the University as TRANSFER STUDENTS CLASSIFIED AS SOPHOMORES OR JUNIORS will reside in University Housing through their first academic year of enrollment.
- C. Students who enter the University as SOPHOMORES and JUNIOR TRANSFER STUDENTS will reside in University Housing through their first academic year of enrollment.
- D. Exceptions will be made by Dean of Student Affairs in individual cases for compelling reasons such as marriage, residence in the home of the student's parents or daily commuters from nearby communities.

Students unable to secure on-campus housing may contact the Office of the Director of Off-Campus Housing for assistance in locating university approved off-campus housing. (All students are required to file a completed Housing Clearance and Information Card with the Director of Housing and receive a Housing Clearance Certificate before attempting to register.)

FOOD SERVICES

The University provides food service for students at a reasonable cost. Two well equipped cafeterias are operated at convenient locations on the campus. They include Murphy Hall, located on the main campus and Brown Hall, located on the corner of Laurel and Bluford Streets. A snack bar is located in the Memorial Union Building.

Students who live in the residence halls are required to eat in the cafeterias. Students who live in the city may purchase meals also.

PLACEMENT SERVICES

The Placement Center is a centralized operation and is responsible for placement activity for all schools, divisions, and departments of the University. It is located in East Hall and provides services to all seniors and graduate students as well as other students seeking employment. The Center offers a continuing service to graduating students and alumni.

Placement services to seniors and graduate students include individual and group conferences, career counseling, arranging interviews between interested students and company representatives on campus. It also provides information to students concerning summer employment and part-time employment. There is no charge to students, alumni, or employers for this service.

VETERANS AFFAIRS AND SERVICES

An information center and clearinghouse services are provided for veterans and war orphans who are admitted and who plan to receive money from the Veterans Administration.

The following are listed for their information and guidance:

1. Report to the Veterans Office as soon as you arrive.
2. Bring any communication you have from the Veterans Administration.
3. Veterans who are enrolling for the first time should bring their separation papers with them.
4. Be prepared to pay all bills and expenses for the first three (3) months.
5. The Veterans Administration requires fourteen hours for full-time student benefits.
6. The Veterans Administration pays no money to the University for veterans training. All money is paid directly to the veteran; therefore each veteran is responsible for meeting all of his financial obligations.

THE MEMORIAL UNION

The Memorial Union, dedicated and opened during the Spring Semester, 1966-67, is the "Community Center", serving diverse needs. It embraces a great variety of facilities and it performs a multiplicity of functions. It is a lounge, reading room, student organizations and activities headquarters, workshop, art gallery, theatre, music room, forum, games room, dance and party center, office building, outing and recreation center, cultural center, ticket bureau, bookstore, conference headquarters, dining room and snack bar, information center, barber shop, public relations agency, refuge for meditation, guest room and meeting room. The physical proximity it provides promotes the sense of community among students, faculty, alumni and publics of the University. The Union facilitates a positive recreational and cultural mission.

STUDENT ORGANIZATIONS AND ACTIVITIES

The University provides a well-balanced program of activities for moral, spiritual, cultural and physical development of the students. Religious, cultural, social and recreational activities are sponsored by various committees, departments, and organizations of the university. Outstanding artists, lecturers and dramatic productions are brought to the campus also.

A listing of student organizations, their purposes, objectives, etc., is provided in the Student Handbook.

STUDENT CONDUCT

Students enrolled at North Carolina Agricultural and Technical State University are expected to conduct themselves properly at all times. They are expected to observe standards of behavior and integrity that will reflect credit upon themselves, their families and the university. They are expected to abide by the laws of the city, state, and nation, and by all rules and regulations of the University.

Accordingly any student who demonstrates an unwillingness to adjust to the rules and regulations that are prescribed or that may be prescribed to govern the students body will be suspended or expelled from the institution. Furthermore, any student whose conduct or behavior is not in harmony with the ideals or purposes of the university will be suspended or expelled.

A student may forfeit the privilege of working for the University when, for any reason, he is placed on probation because of misconduct.

SCHOOL OF AGRICULTURE



SCHOOL OF AGRICULTURE

BURLEIGH C. WEBB, *Dean*

Philosophy and Objectives. The School of Agriculture embraces the fundamental philosophy of the Land-Grant Institution and it accepts the obligation to provide a program of resident and off-campus instruction adequate to meet the needs of those who seek this service. It administers to the general needs of an interdependent rural-urban society and to the special needs of those who desire and benefit from instruction in agriculture, and home economics.

The objectives of the School of Agriculture are two fold: (1) to extend the frontiers of knowledge and the professional competencies of its faculty and the academic proficiency of its students through organized instruction and research and (2) to share its resources with its clientele through organized short courses, conferences, and related activities designed to meet special needs.

Departmental Organization. The School of Agriculture is organized into the following departments: (1) Agricultural Education, (2) Animal Science, (3) Plant Science (4) Home Economics, (5) Agricultural Economics.

Requirements for Admission. The requirements for admission to the School of Agriculture are the same as the general requirements for admission to the University.

Requirements for Graduation. The requirements for graduation for the Bachelor of Science Degree are as follows:

1. The student must have satisfied the course requirements of an approved curriculum in an organized department administered by the School of Agriculture.
2. The student must have earned a cumulative average quality of at least a "C" in his major courses and in his overall academic program.

Curricula. The curricula of the School of Agriculture are designed to provide the students who pursue courses of instruction leading to the Bachelor of Science Degree (1) a fundamental understanding of the basic physical and biological sciences which are applied to their respective majors; (2) liberal educational experiences offered by the University; and (3) a knowledge and competency required for specialization in any one of the major offerings:

Major offerings are as follows:

- A. Technical Agriculture
 1. Agricultural Business
 2. Agricultural Education
 3. Agricultural Science
 4. Agricultural Technology
- B. Home Economics
 1. Clothing, Textiles and Related Art
 2. Food and Nutrition
 3. Home Economics Education
 4. Child Development

A. Technical Agriculture

The curricula and courses in Technical Agriculture are related to career opportunities in the various fields: (1) Farm Production and Technology; (2) Off-Farm Businesses and Industries related to farming and (3) Research and Education. In recognition that each of these fields requires a body of knowledge common to all, and that each has a body of knowledge distinctly peculiar to it, the curricula in Technology, Business, and Science are designed to provide certain required courses and at the same time provide a rather wide degree of flexibility which the student may use to his advantage by selecting courses

in consultation with his faculty advisor that will meet his particular needs and objectives. These curricula are designed to serve the industry of agriculture specifically and the public in general. They provide educational opportunities for students interested in the many sectors of agricultural industries and the intellectual background on which students can build satisfying lives through service.

Agricultural Business. The Agricultural Business major is designed for those students interested in the business industry phase of Agriculture. The objective of the program of instruction in this major is to equip students for employment in those industries that furnish supplies and services to farmers and those that store, process, distribute, and merchandise the products of the farm. Graduates in this major are specially equipped for employment as salesmen, managers, public relations and technical supervisors with companies dealing with feed, seed, fertilizer, food processing and other such industries.

Agricultural Economics. The curriculum in Agricultural Science with an option in Agricultural Economics is administered jointly by the School of Agriculture and the Department of Economics in the School of Arts and Sciences.

Agricultural Education. The curriculum in Agricultural Education offers the student a program of study designed to develop competency in teaching and related types of work. The curriculum is especially suited for the student who aspires to become a teacher of Vocational Agriculture or Agricultural Extension.

The student who wishes to major in Agricultural Education should, preferably at the beginning of the sophomore year or before his junior year, plan with his faculty advisor a course of study which will meet the certification requirements of teachers of Vocational Agriculture in North Carolina.

Agricultural Science. The objective of this program is to provide an opportunity for the student to develop competency in the scientific disciplines essential to graduate study, scientific agriculture, and research.

Agricultural Technology. The curriculum in Agricultural Technology provides an opportunity to develop knowledge and skills in a specialized area of agricultural production. The program of instruction for the student who pursues this program places emphasis on the development of competency in the management and operation of commercial farms or in related industry that require specialized knowledge and technical skills.

B. Home Economics

The curricula leading to the Degree of Bachelor of Science in Home Economics are offered in the area of (1) Clothing, Textiles and Related Art, (2) Food and Nutrition, (3) Home Economics Education, and (4) Child Development.

Clothing, Textiles, and Related Arts. This major leads to professional opportunities in clothing, textiles, fashion and business.

Food and Nutrition. The major in food and nutrition provides three options: (1) Food and Nutrition, (2) Therapeutic Dietetics, and (3) Food Administration.

Home Economics Education. The Home Economics Education major is designed to provide the necessary training and skills for teachers of home economics, for graduate study and for a variety of careers with service organizations with concern for individual and family development.

Child Development. The major in Child Development offers two options—(1) Child Development, which prepares students for positions as directors of nursery school and kindergarten programs, and (2) Early Childhood Education, which prepares students for teaching positions in Kindergarten through Grade 3.

DEPARTMENT OF AGRICULTURAL ECONOMICS

The Agricultural Economics majors may choose to concentrate in either Agricultural Business or Agricultural Science. The former is concerned with the business or indus-

trial phase of agriculture; the latter group would be more interested in graduate study and research.

DEPARTMENT OF AGRICULTURAL EDUCATION

A. P. BELL, *Chairman*

The Department of Agricultural Education prepares students for positions in educational fields in agriculture and related areas including schools and colleges, agricultural extension, business, trade and professional associations, and government agencies. The Department administers a program approved by the State Department of Public Instruction for the preparation of teachers of agriculture in the public school systems. The program includes courses in general education, professional education, and technical agriculture.

PROGRAM FOR AGRICULTURAL EDUCATION MAJORS

Freshman Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
English 100, 101.....	3	3
Mathematics 101, 102	3	3
History 100, 101.....	3	3
Botany 140	4	—
Zoology 160	—	4
Animal Husbandry 301	—	3
Physical Education	1	1
Education 100.....	1	—
Air or Military Science (Elective)	(1)	(1)
Agricultural Education 101, 102	1	1
	—	—
	16	18

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
English 250	—	2
Psychology 320.....	3	—
Chemistry 101, 102	4	4
Plant Science 110	—	3
Agricultural Engineering 114.....	—	3
Dairy Husbandry 311.....	3	—
Poultry Husbandry 317	3	—
Humanities 200, 201	3	3
Health Education 200	2	—
Agricultural Economics 330	—	3
or Economics 301.....	—	3
Air or Military Science (Elective)	(2)	(2)
	—	—
	18	18

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Agricultural Education 400, 402	2	2
Agricultural Education 401, 403	2	2
Technical Agricultural Electives	3	6
Bacteriology 121	4	—
Earth Science 309	—	3
Education 400	3	—
Psychology 431	—	2
Free Electives	3	3
	—	—
	17	18

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Agricultural Economics 332	3	—
Agricultural Education 501, 502	3	6
Agricultural Engineering 525	—	3
Rural Sociology	2	—
Technical Agriculture Electives	3	—
Zoology 468 or Botany 530	3	—
Agricultural Education 503	—	2
	—	—
	14	11

Twelve credits should be completed in one subject matter area (Technical Agriculture) of specialization.

In addition to the above curriculum, the agricultural education major may follow a degree program with concentration in one of the following areas of technical agriculture:

Agricultural Economics

Agricultural Engineering

Animal Science, including Animal Husbandry, Dairy Husbandry, and Poultry Husbandry

Plant Science, including Crop Science, Soil Science, and Horticulture

The program will be worked out on individual bases by the student and his adviser. The student will be co-advised by the Agricultural Education Staff and a staff member from the subject matter area in which the student does his concentration.

COURSE OFFERINGS IN AGRICULTURAL EDUCATION**Undergraduate****101. Agricultural Education.**

Credit 1(1-0)

(Formerly General Agriculture 1000)

A study of the broad base of modern agriculture with emphasis on current trends and opportunities.

102. Agricultural Education. Credit 1(1-0)
(Formerly General Agriculture 1001)

A continuation of 101 with special emphasis on the development of agriculture as a modern technology and the impact of science on its development.

400. Audio-Visual Aids in Occupational and Technical Education. Credit 2(1-2)
(Formerly Ag-Ed 1240)

Techniques in preparing, using, and evaluating audio-visual aids in occupational and technical education. It includes the use of pictorial materials applied to teaching agriculture and the operation and adjustment of equipment found in departments of occupational agriculture.

401. Youth Organizations and Leadership in Secondary Schools. Credit 2(2-0)
(Formerly Ag-Ed 1241)

Practices and procedures of setting up local, district, and State organizations. Emphasis will be placed on duties and responsibilities of officers and members and how to take advantage of training opportunities.

402. Secondary Education in Agriculture. Credit 2(2-0)
(Formerly Ag-Ed 1242)

Designed to acquaint students with the historical objectives of vocational education and agriculture, the problems in the area of secondary schools, and some solutions.

403. Materials and Methods of Teaching Out-of-School Groups. Credit 2(2-0)
(Formerly Ag-Ed 1243)

Methods and materials used in teaching adults and young farmers. It will include developing and using various teaching devices and aids for out-of-school groups.

501. Materials and Methods of Teaching Agricultural Education. Credit 3(3-0)
(Formerly Ag-Ed 1261)

Principles of teaching as applied to agriculture in secondary schools. Preparing and using lesson plans and organizing teaching aids to meet community needs. Prerequisites: Agricultural Education 400 and 402; Psychology 320.

502. Student Teaching. Credit 6(6-0)
(Formerly Ag-Ed 1262)

Students will be required to spend twelve weeks in an approved teaching center doing observation and directed student teaching. Prerequisite: Agricultural Education 501.

503. Evaluation and Problems in Teaching Agricultural Education. Credit 2(2-0)
(Formerly Ag-Ed 1263)

The process of discovering and analyzing problems in the field; program building, and evaluation of instruction in vocational education. This will include an appraisal of all phases taught by the teacher of agriculture. Prerequisites: Agricultural Education 501 and 502.

Advanced Undergraduate and Graduate

601. Adult Education in Occupational Education. Credit 3(3-0)
(Formerly Ag-Ed 1271)

A study of the principles and problems of organizing and conducting programs for adults. Emphasis is given to the principles of conducting organized instruction.

- 602. The Principles of Agricultural Education.** Credit 3(3-0)
(Formerly Ag-Ed 1272)

A study of the principles and practices in agricultural education revealed by research and new trends.

- 603. Problem Teaching in Occupational Education.** Credit 3(3-0)
(Formerly Ag-Ed 1273)

Practices in setting up problems for teaching unit courses in vocational agriculture.

- 604. Public Relations in Vocational Agriculture.** Credit 3(3-0)
(Formerly Ag-Ed 1274)

Principles and practices of organizing, developing, and implementing public relations for promoting local programs.

- 605. Guidance and Group Instruction in Occupational Education.** Credit 3(3-0)
(Formerly Ag-Ed 1275)

Guidance and group instruction applied to agricultural occupations and other problems of students in vocational education.

- 606. Cooperative Work-Study Programs.** Credit 3(3-0)

Principles, theories, organizations, and administration of cooperative work experience programs.

Graduate

These courses are open to graduate students only: See the Bulletin of the Graduate School for course descriptions.

- 700. Seminar in Agricultural Education.** Credit 1(1-0)
(Formerly Ag-Ed 1285)

- 702. Methods and Techniques of Public Relations.** Credit 3(3-0)
(Formerly Ag-Ed 1286)

- 703. Research in Agricultural Education.** Credit 3(3-0)
(Formerly Ag-Ed 1287)

- 704. Philosophy of Occupational Education.** Credit 3(3-0)
(Formerly Ag-Ed 1288)

- 705. Recent Developments and Trends in Agricultural Education.** Credit 3(3-0)
(Formerly Ag-Ed 1289)

- 750. Community Problems.** Credit 3(3-0)
(Formerly Ag-Ed 1290)

- 751. Methods and Techniques of Supervision in Agricultural Education.** Credit 3(3-0)
(Formerly Ag-Ed 1291)

- 752. Administration and Supervision.** Credit 3(3-0)
(Formerly Ag-Ed 1292)

- 753. Program Planning.** Credit 3(3-0)
(Formerly Ag-Ed 1293)

- 754. History of Agricultural Education.** Credit 3(3-0)
(Formerly Ag-Ed 1294)

- 760. Thesis Research in Agricultural Education.** Credit 3(3-0)
(Formerly Ag-Ed 1299)

DEPARTMENT OF ANIMAL SCIENCE

TALMAGE BREWER, *Acting Chairman*

1. The Department of Animal Science offers courses designed to meet the diverse interests of students by offering a choice of several options of study in which the students may specialize. Students wishing a major in Agricultural Sciences or Agricultural Technology may concentrate in either of the following fields of specialization: Animal Science, Dairy Science, Dairy Manufacturing or Poultry Science.
The specialized options of the students are particularly well suited for positions as farm managers, professional workers in agricultural industries and government employment.
2. A Pre-Veterinary Science Program, which is an option to the Animal Science curriculum and referred to as the 3-1 plan, is also offered by the Department. The 3-1 designation is given because under the plan, three years of work is done toward the B.S. Degree in Animal Science at A&T, and upon successful completion of the first professional year at Veterinary School the student would be eligible for the Bachelor of Science Degree in Animal Science. One of the main advantages of such a plan is to provide an opportunity for the Animal Science major to obtain both the B.S. and the DVM Degrees without interrupting the continuity of his academic program.
3. The freshman and sophomore years are devoted mostly to a program of general education which provides background in the social and physical sciences, and mathematics, and includes an introduction to the humanities as well as introductory courses to the study of Animal Science.

PROGRAM FOR AGRICULTURAL TECHNOLOGY MAJORS

Freshman Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
English 100, 101.....	3	3
History 100, 101.....	3	3
Botany 140; Zoology 160	4	4
Mathematics 111, 113	4	4
Agricultural Education 101, 102	1	1
Education 100.....	1	—
Air or Military Science (Elective).....	1	1
	<hr/> 16-17	<hr/> 15-16

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Humanities 200, 201	3	3
Chemistry 101, 102	4	4
Animal Science 301; Poultry Science 317.....	3	3
Dairy Science 311; Plant Science 110	3	3
Agricultural Economics 330	3	—
Health Education 200	—	2
Air or Military Science (Elective).....	2	2
	<hr/> 16-18	<hr/> 15-17

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Economics 301; Agricultural Economics 332	3	3
General Microbiology 121	4	—
Agricultural Engineering 114; Soil Science 338	3	4
*Electives (Major Area)	4	7
Electives	3	3
	<hr/> 17	<hr/> 17

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Animal Science 404; Soil Science 517	3	3
Animal Science 443; Agricultural Engineering 402	2	3
*Electives (Major Area)	9	8
	<hr/> 14	<hr/> 14

Supporting Courses (Elective)

Agricultural Economics 334, 336; Business 440, 458; Speech 250, 251; Agricultural Engineering 303, 522; Industrial Technology 410; Mathematics 240.

PROGRAM FOR AGRICULTURAL SCIENCE MAJORS

Freshman Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
English 100, 101	3	3
Social Science 100, 101	3	3
Botany 140; Zoology 160	4	4
Mathematics 111, 113	4	4
Agricultural Education 101, 102	1	1
Education 100	1	—
Air or Military Science (optional)	1	1
	<hr/> 16-17	<hr/> 15-16

* The 28 credits as major electives are to be taken such that: 12 credits are selected from supporting courses; 16 credits are selected from the area of concentration with approval of the advisor.

Sophomore year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Humanities 200, 201	3	3
Chemistry 101, 102	4	4
Agricultural Engineering 113; Animal Science 301	3	3
Plant Science 110; Poultry Science 317	3	3
Health Education 200	2	—
Air or Military Science (optional).....	2	2
	<hr/> 15-17	13-15

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Physics 211, 212	4	4
Soil Science 338	—	4
Chemistry 221; Economics 301	5	3
*Electives (Major Area)	6	3
Electives	3	3
	<hr/> 18	<hr/> 17

Senior year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Mathematics 224	—	3
Agricultural Economics 330	3	—
Bacteriology	4	—
*Electives (Major Area)	9	12
	<hr/> 16	<hr/> 15

Supporting Courses (Electives)

Zoology 461, 465, 466; Agricultural Economics 332, 334, 336; Chemistry 222, 251; Speech 250, 251.

* The 30 credits required as major electives are to be taken such that: 12 credits are elected from supporting courses; 18 credits are elected from the area of concentration with approval of the advisor.

PRE-VETERINARY ANIMAL SCIENCE PROGRAM

Suggested Curriculum

First Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
English 100, 101.....	3	3
Mathematics 111, 113	4	4
History 100, 101.....	3	3
Botany 140; Zoology 160	4	4
General Agriculture 101, 102.....	1	1
Education 100.....	1	1
	<hr/> 16	<hr/> 16

Second Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Humanities 200, 201	3	3
Chemistry 101, 102	4	4
Animal Science 301; Dairy Science 311	3	3
*Restricted Electives	3	3
Poultry 317	—	3
Health Education 200	2	—
	<hr/> 15	<hr/> 16

Third Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Physics 225, 226.....	4	4
Animal Science Electives.....	6	6
Bacteriology 121.....	—	4
Chemistry 221.....	5	—
Electives.....	3	3
	<hr/> 18	<hr/> 17

▪ See major advisor.

COURSES IN ANIMAL SCIENCE**Undergraduate**

- 301. Principles of Animal Science.** Credit 3(2-2)
(Formerly 1301)

An introduction to the livestock-meat industry involving the fundamentals of modern livestock production, marketing and processing, including animal nutrition, reproduction, market classes and grades, meat processing and technology and milk production.

- 302. Judging and Selecting Dairy and Meat Animals.** Credit 3(1-4)
(Formerly 1302)

Detailed consideration of factors involved in selection and evaluation of beef cattle, dairy cattle, swine, sheep and horses. Ability to present accurate, clear and concise reasons is stressed.

- 401. Meat and Meat Products.** Credit 3(2-2)
(Formerly 1321)

Slaughtering and cutting carcasses of cattle, sheep and hogs. Factors affecting quality, palatability, and economy in selection of meats.

- 402. Animal Breeding.** Credit 3(2-2)
(Formerly 1322)

A study of the principles of genetics as applied to the improvement of animals and some of the methods and problems of the breeder.

- 320. Livestock Production.** Credit 4(3-2)
(Formerly 1323)

Breeds of beef cattle, swine and sheep—their selection, care and management.

- 404. Livestock Feeding.** Credit 3(3-0)
(Formerly 1324)

Principles of feeding and composition of feeds.

- 441. Anatomy and Physiology of Farm Animals.** Credit 3(2-2)
(Formerly 1341)

Designed to acquaint students with structure and functions of organs, tissues and systems of farm animals.

- 442. Physiology of Reproduction of Farm Animals.** Credit 3(2-2)
(Formerly 1342)

Anatomy of the reproduction organs with detailed coverage of the physiology processes involved and of factors controlling and influencing them.

- 443. Disease of Farm Animals.** Credit 2(2-0)
(Formerly 1343)

The common disease of livestock with reference to cause, prevention and treatment.

- 601. Principles of Animal Nutrition.** Credit 3(3-0)
(Formerly 1371)

Fundamentals of modern animal nutrition including classification of nutrients, their general metabolism and role in productive functions. (Prerequisite A. S. 404)

- 602. Animal Science Seminar.** Credit 1(1-0)
(Formerly 1372)

A review and discussion of current literature pertaining to all phases of Animal Science.

- 603. Advanced Livestock Management.** Credit 3(3-0)
(Formerly 1373)

Special work in problems in dealing with feeding, breeding, and management in the production of beef cattle, sheep and swine.

COURSES IN DAIRY SCIENCE

Undergraduate

- 311. Principles of Dairying.** Credit 3(2-2)
(Formerly 1311)

The fundamental principles of dairying, types of dairy cattle; the composition of milk, its chemical and physical properties, sampling and testing of milk; selection and herd management.

- 312. Dairy Technology** Credit 2(1-2)
(Formerly 1312)

A continuation of 311- more detailed use of Babcock Test for other dairy products, as well as other laboratory tests.

- 312. Dairy and Food Plant Sanitation** Credit 2(1-2)
(Formerly 1313)

Principles and procedures involved in sanitary standards and regulations for milk and food products; related areas of water, air, and environmental sanitation will also be included.

- 314. Dairy Plant Practice.** Credit 2(0-4)
(Formerly 1314)

Assigned practice work at the college dairy and the milk and ice cream laboratories of the college dairy plant; given for both dairy manufacturing and dairy science majors. (Prerequisite—three dairy courses.)

- 405. Dairy Plant Management.** Credit 2(1-2)
(Formerly 325)

The organization and management of dairy plant; procurement of raw supplies; plant layout; equipment for plants, distribution of products, cost and operation, and record keeping.

- 406. Dairy Products Judging.** Credit 2(0-4)
(Formerly 1326)

Standards and grades of dairy products; practice in judging milk, cream, butter, and ice cream.

- 407. Market Milk.** Credit 2(1-2)
(Formerly 1327)

The market milk industry, milk ordinances, city milk, supply, transportation, grading, pasteurizing, bottling and distribution. (Prerequisite Da. Sci. 311, 312.)

- 408. Advanced Dairy Technology.** Credit 2(1-2)
(Formerly 1328)

Theory of and practice in analytical methods used for control in the dairy manufacturing plant. (Prerequisite Dairy Sci. 407)

- 409. Ice Cream Making.** Credit 3(1-4)
(Formerly 1329)

The principles involved in the manufacturing of commercial ice cream and ices.

- 430. Dairy Cattle and Milk Production.** Credit 4(3-2)
(Formerly 1330)

Breeds of dairy cattle; problems of economical milk production; fitting and showing.

- 444. Dairy Breeds and Pedigrees.** Credit 2(1-2)
(Formerly 1344)

A study of dairy pedigrees and breed families; testing and association methods.

- 445. Dairy Cattle Judging.** Credit 2(1-2)
(Formerly 1345)

Characteristics of dairy breeds and score card requirements; relation of type, form and function to the value of selection. Practice judging.

Advanced Undergraduate and Graduate

- 604. Dairy Seminar.** Credit 1(1-0)
(Formerly 1374)

Assignments of papers on subjects relating to the dairy industry and methods of preparing and presenting such papers.

- 606. Special Problems.** Credit 3(3-0)
(Formerly 1376)

Assignment of work along special lines in which a student may be interested, given largely by the project method for individuals either in Dairy Manufacturing or Dairy Science. (Prerequisite—three advanced courses in dairying.)

COURSES IN POULTRY SCIENCE

Undergraduate

- 317. Poultry Production.** Credit 3(2-2)
(Formerly 1317)

Practices and principles of poultry production.

- 330. Fundamentals of Poultry Breeding.** Credit 4(3-2)
(Formerly 1338)

Breeding and selection and improvement of stock. (Prerequisite Poultry Sci. 317.)

- 501. Diseases and Parasites of Poultry.** Credit 3(2-2)
(Formerly 1356)

Poultry hygiene; causes of diseases; symptoms and control of diseases and parasites. (Prerequisite Poultry Sci. 317.)

- 503. Incubation and Hatchery Management.** Credit 4(2-4)
(Formerly 1357)

Management of poultry farm and hatchery operation. (Prerequisite Poultry Sci. 317.)

- 505. Processing and Marketing of Poultry Products.** Credit 3(2-2)
(Formerly 1358)

Methods of killing, dressing, grading and storage of poultry meats and the grading and storage of eggs; transportation of poultry products and factors influencing price. (Prerequisite Poultry Sci. 317.)

Advanced Undergraduate and Graduate

- 608. Poultry Seminar.** Credit 1(1-0)
(Formerly 1378)

Special articles and reports on subjects relating to the poultry industry will be assigned each student with round table discussion.

- 609. Poultry Anatomy and Physiology.** Credit 3(2-2)
(Formerly 1379)

A course which deals with the structure and function of tissues, organs, and systems of the domestic fowl. (Prerequisite Poultry Sci. 501.)

- 690. Special Problems in Poultry.** Credit 3(3-0)
(Formerly 1380)

Assignment of work along special lines in which a student may be interested, given largely by project method for individuals in Poultry Science. (Prerequisite—Three advanced courses in Poultry Sci.)

GRADUATE COURSES

These courses are open to graduate students only. See the bulletin of the Graduate School for course descriptions.

GRADUATE COURSES IN ANIMAL SCIENCE

- 690. Selection of Meat and Meat Products.** Credit 3(2-2)
(Formerly 1385)
- 702. Advanced Livestock Marketing.** Credit 3(3-0)
(Formerly 1386)
- 703. Advanced Livestock Production.** Credit 3(2-2)

GRADUATE COURSE IN DAIRY SCIENCE

- 705. Advanced Dairy Farm Management.** Credit 3(2-2)
(Formerly 1385)

GRADUATE COURSE IN POULTRY SCIENCE

- 780. Poultry Research.** Credit 3(0-6)
(Formerly 1394)

DEPARTMENT OF HOME ECONOMICS

E. BERNICE JOHNSON, *Acting Chairman*

The curricular requirements of the Department of Home Economics have been selected to provide a background for the development of competencies and values which will:

1. Make possible satisfying personal, group, and family relationships as a basis for active participation in a democratic society;
2. Lead to the enrichment of home and family living through the appreciation and use of art and advances in science and technology;
3. Develop understanding and appreciation of varying cultural backgrounds; and
4. Prepare the individual for gainful employment in one of the major areas of the profession.

Home Economics courses are not restricted to majors in the Department. All introductory courses may be taken by any student. Admittance to other courses may be secured upon receiving approval of the instructor.

The Department of Home Economics offers a graduate program leading to the Master of Science degree in Food and Nutrition. This program leads to opportunities as nutrition specialists; food specialists in journalism, radio and television; public health nutritionists; college teachers; and research technicians in food and nutrition.

MAJOR AREAS IN THE DEPARTMENT

The department offers the Bachelor of Science degree with majors in the following areas: (1) Child Development—CD; (2) Clothing, Textiles and Related Art—CTA; (3) Food and Nutrition—FN; and (4) Home Economics Education—HEc. The Food and Nutrition major offers options in (1) Food and Nutrition, (2) Therapeutic Dietetics, and (3) Food Administration. Information concerning the graduation requirements for each of the four areas is given in the following pages. A minimum of 124 semester hours are required to earn a Bachelor of Science degree in Home Economics.

The selection of electives must be approved by the Student's adviser.

PROGRAM FOR THE MAJOR IN CHILD DEVELOPMENT

This program provides a broad knowledge of children through the study of their development and relationships. Students can select supporting courses in psychology, sociology, food and nutrition or other areas of special interest. A variety of appropriate experiences with young children is an integral part of the program. Employment opportunities for students in this curriculum include teacher and/or supervisor of pre-school groups (Head Start, Day Care, Nursery Schools, public and private); Child Care Specialists in Federal, State, and County Extension Service Programs; Graduate work for research and teaching; and Child and Family Life Coordinators to work with Health Agencies, Public School Program, Community Service Agencies and Food Service Programs for children.

PROGRAM FOR THE MAJOR IN CHILD DEVELOPMENT

Freshman Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
English 100, 101.....	3	3
Mathematics 101, 102.....	3	3
History 100, 101.....	3	3
Physical Education 101, 101.....	1	1
Clothing, Textiles & Related Art 122.....	2	—
Home Economics 101.....	1	—
Physical Science 100.....	—	4
Health Education 200.....	2	—
Electives.....	—	2
	15	16

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Humanities 200, 201.....	3	3
Psychology 320.....	3	—
Child Development 311, 312.....	3	3
Child Development 315.....	—	3
Zoology 160, 461.....	4	4
Art 226.....	3	—
Sociology 100.....	—	3
	16	16

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Child Development 414.....	3	—
Child Development 416.....	3	—
Child Development 418.....	—	3
Food and Nutrition 437.....	3	—
Home Economics 400, 403.....	3	3
Child Development 413.....	—	3
Speech 250.....	—	2
Anthropology 200.....	—	3
Education 301.....	2	—
Electives.....	—	3
	14	17

Senior Year

<i>Course and Number</i>	<i>all Semester Credit</i>	<i>Spring Semester Credit</i>
Child Development 519.....	6	—
Child Development 610.....	—	3
Child Development 612.....	2	—
Home Economics 401.....	—	3
Electives.....	4	10
	—	—
	12	16

PROGRAM FOR THE MAJOR IN CLOTHING, TEXTILES AND RELATED ART

This major leads to professional opportunities in clothing, textiles, fashion and business.

Freshman Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Home Economics 101.....	1	—
Mathematics 101, 102.....	3	3
Art 100.....	3	—
Clothing, Textiles & Related Art 122, 123, 124.....	5	3
English 100, 101.....	3	3
Food and Nutrition 133.....	—	3
History 100.....	—	3
Physical Education 101, 101.....	1	1
	—	—
	16	16

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
History 101.....	3	—
Clothing, Textiles & Related Art 321.....	—	4
Art 226.....	3	—
Humanities 200, 201.....	3	3
Chemistry 104, 105.....	4	4
Home Economics 400, 401.....	3	3
Health Education 200.....	—	2
	—	—
	16	16

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Clothing, Textiles & Related Art 423	4	—
Clothing, Textiles & Related Art 424, 426.	—	7
Psychology 320	3	—
Sociology 100	3	—
French 100	3	—
Anthropology	—	3
Electives	2	5
	<hr/> 15	<hr/> 15

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Clothing, Textiles & Related Art 621, 521, 622	3	6
Electives	13	6
	<hr/> 16	<hr/> 12

In addition to the above schedule CTRA majors are required to complete a minimum nine (9) semester hours in Related Art courses and Clothing and Textiles courses to complete a minimum of 36 semester hours.

PROGRAM FOR THE MAJOR IN FOOD AND NUTRITION

The major in food and nutrition provides three options: (1) Food and Nutrition, (2) Therapeutic Dietetics, and (3) Food Administration.

The program in food and nutrition provides a strong background for the interpretation and creative use of knowledge of food and nutrition.

Programs in Therapeutic Dietetics and Food Administration are designed to meet the academic requirements of the American Dietetic Association. Graduates are eligible for internships in institutions that have received approval from the Association. These programs offer excellent professional opportunities for men and women who are interested in the service of food for large groups of people.

PROGRAM FOR THE OPTION IN FOOD AND NUTRITION

The option in food and nutrition provides preparation for positions as clinical nutritionists, assistant technicians in food testing and research, and for graduate study.

OPTION I: FOOD AND NUTRITION**Freshman Year**

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
English 100, 101.....	3	3
Clothing, Textiles & Related Art 122.....	—	2
Home Economics 101.....	1	—
Mathematics 111, 112.....	4	4
Physical Education 101, 101.....	1	1
History 100, 101.....	3	3
Zoology 160, 461.....	4	4
	—	—
	16	17

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Chemistry 101, 102.....	4	4
Humanities 200, 201.....	3	3
Bacteriology 121.....	—	4
Speech 250.....	2	—
Psychology 320.....	3	—
Food and Nutrition 130.....	—	4
Physics 201.....	3	—
	—	—
	15	15

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Health Education 200.....	2	—
Chemistry 221, 222.....	5	5
Food and Nutrition 337, 338.....	3	3
Food and Nutrition 331, 436.....	2	3
Food and Nutrition 439.....	—	3
Home Economics 401, 403.....	3	3
	—	—
	15	17

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Chemistry 231, 251.....	4	3
Food and Nutrition 535.....	3	—
Food and Nutrition 637, 638.....	3	2
Food and Nutrition 630, 639.....	—	4
Electives.....	4	4
	—	—
	14	13

PROGRAM FOR THE OPTION IN THERAPEUTIC DIETETICS

The option in Therapeutic Dietetics should be selected by students interested in therapeutic or administrative dietetics in institutions such as hospitals. This option prepares students for clinical internships or graduate study.

OPTION 2: THERAPEUTIC DIETETICS**Freshman Year**

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
English 100, 101	3	3
Zoology 160, 461	4	4
Home Economics 101	1	—
Mathematics 101, 102	3	3
History 100, 101	3	3
Physical Education 101, 101	1	1
Health Education 200	—	2
	—	—
	15	16

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Chemistry 104, 105	4	4
Humanities 200, 201	3	3
Food and Nutrition 130	—	4
Psychology 320	3	—
Clothing, Textiles & Related Art 122	2	—
Food Administration 344	3	—
Food Administration 345, 346	—	7
Speech 250	2	—
	—	—
	17	18

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Food and Nutrition 337, 338	3	3
Chemistry 251	—	3
Bacteriology 121	4	—
Psychology 435	—	3
Food Administration 447, 448	5	4
Food and Nutrition 331	2	—
Electives	3	3
	—	—
	17	16

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Food and Nutrition 630.....	—	3
Home Economics 401, 403.....	6	—
Food Administration 544	—	3
Electives.....	6	5
	—	—
	12	11

PROGRAM FOR THE OPTION IN FOOD ADMINISTRATION

This option is designed for students interested in food service administration in hospitals, business, industry or educational institutions. Selection of this option qualifies the graduate for (1) employment in assistant supervisory positions in food businesses or industrial plant cafeterias, (2) the operation of private businesses, (3) approved Food Service Administration Internships, or (4) graduate study in Hotel or Food Administration.

OPTION 3: FOOD ADMINISTRATION**Freshman Year**

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
English 100, 101.....	3	3
Zoology 160, 461	4	4
Home Economics 101	1	—
Mathematics 101, 102	3	3
History 100, 101.....	3	3
Physical Education 101, 101.....	1	1
Health Education 200	—	2
	—	—
	15	16

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Humanities 200, 201	3	3
Chemistry 104, 105	4	4
Business Administration 305	3	—
Accounting 221, 222	3	3
Food Administration 344	3	—
Food Administration 346	—	4
Food and Nutrition 130.....	—	4
	—	—
	16	18

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Food and Nutrition 337, 338, 345.....	3	6
Food Administration 447, 448	5	4
Psychology 320.....	3	—
Economics 301	3	—
Accounting 441, 442	3	3
Bacteriology 121.....	—	4
Food and Nutrition 331.....	2	—
	<hr/> 19	<hr/> 17

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Business Administration 569	3	—
Food Administration 549, 544	3	3
Home Economics 401	3	—
Electives.....	3	6
	<hr/> 12	<hr/> 9

PROGRAM FOR THE MAJOR IN HOME ECONOMICS EDUCATION

The Home Economics Education major is designed to provide the necessary training and skills for teachers of Home Economics, for graduate study and for a variety of careers with service organizations with concern for individual and family development. A student cannot receive a major in Home Economics Education without the education requirements requisite for teacher preparation.

The selection of electives should be made in consultation with the student's adviser. See page 176-177 for University requirements in teacher education.

Freshmen Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
English 100, 101.....	3	3
History 100, 101.....	3	3
Mathematics 101, 102	3	3
Physical Education 101, 101.....	1	1
Zoology 160, 461	4	4
Home Economics 101	1	—
Clothing, Textiles & Related Art 122	—	2
	<hr/> 15	<hr/> 16

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Health Education 200	2	—
Humanities 200, 201	3	3
Psychology 320	—	3
Chemistry 104, 105	4	4
Education 300, 301	2	2
Art 226	3	—
Food and Nutrition 130	—	4
Clothing, Textiles & Related Art 123	3	—
	<hr/> 17	<hr/> 16

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Food and Nutrition 337	3	—
Clothing, Textiles & Related Art 321	—	4
Speech 250	2	—
Child Development 311	3	—
Physics 201	3	—
Economics 301	—	3
Home Economics 400, 401	3	3
Education 400	—	3
Home Economics 505 or Food and Nutrition 331 and Elective	3	4-5
Home Economics 403	3	—
	<hr/> 17	<hr/> 17-18

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Home Economics 503	2	—
Education 528, 500, 560	3	9
Home Economics 502	2	—
Home Economics 505 or Food and Nutrition 331 and Elective	5-6	—
Home Economics 604	—	2
	<hr/> 12-13	<hr/> 11

COURSES IN CHILD DEVELOPMENT AND EARLY CHILDHOOD EDUCATION**Undergraduate**

- 311. Child Development I.** Credit 3(3-0)
(Formerly CD 1921)

A cross-cultural study of the behavior, development, and relationships of the young child in a familial context. (Laboratory required for observation of 3-, 4- and 5-year-old children).

- 312. Child Development II.** Credit 3(3-0)
(Formerly CD 1922)

A comprehensive study of physical, social and psychological development from middle childhood through adolescence. Individual students plan field study of adolescents in groups as part of course content. (Prerequisite CD 311.)

- 315. Study of the Child in Family and Community.** Credit 3(3-0)
(Formerly CD 1925)

Historical background and present-day philosophies of child study, parent education and early childhood education. This course covers techniques of child study and of parent and community involvement.

- 413. Infant Development.** Credit 3(3-0)
(Formerly CD 1923)

This course focuses upon the importance of infancy as a crucial period in human development and covers the following categories: prenatal, perinatal and neonatal development; infant learning and copying; personality; and infant care and deprivation. (Prerequisite CD 311.)

- 414. Creative Activities I.** Credit 3(1-4)
(Formerly CD 1926)

Fine and applied arts-creative use of media with young children; to include art, music and rhythmic. (nursery school and kindergarten)

- 415. Creative Activities II.** Credit 3(1-4)
(Formerly CD 1926)

Fine and applied arts-creative use of media with young children; to include art, music and rhythmic. (grades 1, 2 and 3)

- 416. Literature and Language Arts I.** Credit 3(1-4)
(Formerly CD 1927)

A survey of literature for young children and media and methodology of reading. (nursery school and kindergarten)

- 417. Literature and Language Arts II.** Credit 3(1-4)
(Formerly CD 1927)

A survey of literature for young children and media and methodology of reading. (grades 1, 2 and 3)

- 418. Science and Social Studies I.** Credit 3(1-4)
(Formerly CD 1952)

A study of the basic concepts from the physical, mathematical and social sciences necessary for the instruction of young children. Special emphasis is placed upon ecological studies and the development of human cultures and relationships. (nursery school and kindergarten)

419. Science and Social Studies II.
(Formerly CD 1952)

Credit 3(1-4)

A study of the basic concepts from the physical, mathematical and social sciences necessary for the instruction of young children. Special emphasis is placed upon ecological studies and the development of human cultures and relationships. (grades 1, 2 and 3)

519. Practicum in Child Development.
(Formerly CD 1969)

Credit 6(2-8)

Methods, observation and guided experiences in the preschool laboratory (for majors in Option 1).

Advanced Undergraduate and Graduate

610. Measurement and Evaluation in Child Development.
(Formerly CD 1970)

Credit 3(3-0)

A study of the methods of measurement, evaluation and diagnosis in learning-teaching situations.

612. Senior Seminar.
(Formerly CD 1971 and 1972)

Credit 2(2-0)

A review of recent research findings and discussion of current trends and information related to young children.

613. Methods in Early Childhood.
(Formerly CD 1968 and 1973)

Credit 3(3-0)

Administration, principles, practices, methods, and resources in the organization of preschool and primary programs. An interdisciplinary and team approach. Observation of teaching styles and strategies.

614. Curriculum in Early Childhood.
(Formerly CD 1974)

Credit 3(3-0)

Curriculum experiences and program planning appropriate to early childhood education.

Graduate

715. Special Problems in Child Development.
(Formerly CD 1985)

Credit 3(3-0)

Opportunity for students to work individually or in small groups of child development problems of special interest. Work may represent either survey of a given field or intensive investigation of a particular problem. The student should consult the instructor before registering for this course.

COURSES IN CLOTHING, TEXTILES AND RELATED ART

Undergraduate

122. Clothing for the Family.
(Formerly CTA 1802)

Credit 2(2-0)

A study of the individual clothing needs of family members; wardrobe planning; socio-economic and psychological aspects of clothing; buying principles, procedures and practices.

- 123. Textiles.** Credit 3(2-2)
(Formerly CTA 1820)
Textile fibers, their sources, characteristics, merits, limitations and production into fabric; the hygienic aspects, use and care of fabrics.
- 124. History of Costume.** Credit 3(3-0)
(Formerly CTA 1824)
A study of the history of costume from ancient to modern times.
- 125. History of Textiles.** Credit 3(3-0)
A study into the historic background of textiles from ancient civilization to present day.
- 321. Family Clothing Construction.** Credit 4(1-6)
(Formerly CTA 1821)
Fundamental principles of clothing construction based on the use of the commercial pattern. A consideration of the clothing needs of family members with laboratory experiences to meet individual needs. Prerequisite: CTA 122.
- 323. Home Crafts.** Credit 3(1-4)
(Formerly CTA 1843)
Instruction in crafts and accessories for the home, including draperies, curtains, cornices, valances, swags, covers for chairs, tables, lampshades, bedspreads, rugs, and needlepoint.
- 422. Dress Design and Pattern Study.** Credit 3(1-4)
(Formerly CTA 1822)
A study of flat pattern making and variations in commercial patterns.
- 423. Advanced Clothing Construction.** Credit 4(1-6)
(Formerly CTA 1823)
The application of art principles in creating dress designs by draping methods. Emphasis on the use of new fabrics and trends as creative expression in clothing construction.
- 424. Tailoring for Women.** Credit 4(2-4)
(Formerly CTA 1844)
A study of the principles of custom tailoring as they apply to women's coats and suits. Laboratory experiences in the construction of women's coats and suits. Prerequisite: CTA 423.
- 426. Problems in Clothing, Textiles and Related Art.** Credit 3(0-6)
A or B
(Formerly CTA 1826) Credit 3(0-6)
Independent study on special problems in clothing, textiles or related art.
- 521. Workroom Techniques in Clothing, Textiles or Related Art** Credit 6(1-10)
(Formerly CTA 1861)
A course designed to give the student practical experiences in one of the areas of clothing, textiles or related art.
- 522. Millinery.** Credit 3(1-4)
(Formerly 1842)
An introduction to the use of various millinery equipment and materials.

Advanced Undergraduate and Graduate

- 620. Fashion Coordination.** Credit 1(1-0)
(Formerly CTA 1870)
A study of the factors which influence the fashion world; trends, designers, centers and promotion. Field trips to fashion centers.
- 621. Seminar in Clothing, Textiles and Related Art.** Credit 1(1-0)
A or B
(Formerly CTA 1871)
A study of current trends in the field of Clothing, Textiles and Related Art.
- 622. Economics of Clothing and Textiles.** Credit 2(2-0)
(Formerly CTA 1872)
A study of the economic aspects of clothing and household textiles as they relate to the needs and resources of families in their quest for maximum satisfaction and serviceability.
- 623. Textile Chemistry.** Credit 3(1-4)
An introduction to the chemistry of the major classes of natural and man-made fibers, including their structure, properties, and reactions. Laboratory work will include consideration of chemical damage to fabrics, finishes and dyes. Prerequisites: Chemistry 104 and 105, Textiles 123.
- 624. Advanced Textiles.** Credit 3(2-2)
(Formerly CTA 1873)
A study of the physical and chemical properties of textile fibers and fabrics with emphasis on recent scientific and technological developments.
- 625. Experimental Clothing and Textiles.** Credit 3(1-4)
Experimentation with new woven fabrics and non-textiles such as furs, leathers, suedes.

COURSES IN FOOD AND NUTRITION**Undergraduate**

- 130. Food Preparation.** Credit 4(2-4)
(Formerly F&N 1830)
The application of scientific principles to food preparation and preservation. Prerequisites: Chemistry 102 or 105, or concurrent.
- 133. Family Food.** Credit 3(2-2)
(Formerly F&N 1803)
Principles of food preparation and nutrition; laboratory experiences in the selection, preparation, and serving of food to meet the nutritional needs of the family; role of diet in the maintenance of health and well being.
- 331. Meal Planning and Table Service.** Credit 2(1-2)
(Formerly F&N 1831)
Planning of meals with consideration of the economic and nutritional needs of all family members. Laboratory experiences provide opportunity to develop skill in the judgment and use of the more recent food products and equipment as time, money, and energy-saving measures. Prerequisite: F&N 130.

- 337. Nutrition and Dietetics.** Credit 3(2-2)
(Formerly F&N 1827)

The application of the scientific principles of nutrition to the planning of diets for various age groups. Prerequisites: Chemistry 102 or 105.

- 338. Diet Therapy.** Credit 3(2-2)
(Formerly F&N 1828)

A study of dietary modifications necessary in the treatment of pathologic conditions. Prerequisite: F&N 337.

- 436. Experimental Cookery.** Credit 3(2-2)
(Formerly F&N 1846)

A study of the chemical and physical composition and behavior of food.

- 437. Food and Nutrition in Early Childhood.** Credit 3(2-2)

Elementary principles of food and nutrition adapted to the needs of young children in home and group situations.

- 439. Child Nutrition.** Credit 3(2-2)
(Formerly F&N 1829)

A study of the principles of nutrition and their application to the feeding of children in family and nursery school groups.

- 535. Nutrition Education.** Credit 3(3-0)
(Formerly F&N 1845)

A course designed to assist in the development of nutrition education programs in the school and community.

Advanced Undergraduate

- 630. Advanced Nutrition.** Credit 3(3-0)
(Formerly F&N 1880)

Advanced discussion of the roles of vitamins, minerals, protein, fat, and carbohydrate in the body and their interrelationships. Prerequisites: F&N 337 and Chemistry 251 or concurrent.

- 636. Food Testing and Promotion.** Credit 4(2-4)

Recipe manipulation and testing; food demonstration techniques; food journalism and photography.

- 637. Special Problems in Food and Nutrition.** Credit 3(0-6)
(Formerly F&N 1877)

Individualized work on special problems in food and nutrition.

- 638. Recent Developments in Food and Nutrition.** Credit 2(2-0)
(Formerly F&N 1878)

A study of recent research in food and nutrition through discussion of reports in current scientific journals.

- 639. Seminar in Food and Nutrition.** Credit 1(1-0)
(Formerly F&N 1879)

History of food and nutrition; past and present theories and methods; specialists and their contributions.

Graduate

- 731. Nutrition and Health.** Credit 2(2-0)
(Formerly F&N 1888)
Relation of essential nutrients to metabolism; evaluation of nutritional status. (Prerequisite: Food and Nutrition 337 or its equivalent.)
- 732. Nutrition and Disease.** Credit 4(3-2)
(Formerly F&N 1889)
Biochemistry of deficiency diseases; diet as a therapeutic tool. (Prerequisite: Food and Nutrition 338 or its equivalent.)
- 733. Nutrition During Growth and Development.** Credit 3(3-0)
(Formerly F&N 1884)
Nutritional needs of children, development of food habits, school lunch programs.
- 734. Nutrition Education.** Credit 3(2-2)
(Formerly F&N 1886)
Interpretation of the results of nutrition research for use with lay groups. Preparation of teaching materials based on research for use in nutrition education programs.
- 735. Experimental Foods.** Credit 4(1-6)
(Formerly F&N 1885)
Objective and subjective evaluation of food; development and testing of recipes; experimentation with food. (Prerequisite: Food and Nutrition 436 or its equivalent.)
- 736. Research Methods in Food and Nutrition.** Credit 4(2-6)
(Formerly 1887)
Experimental procedures in food and nutrition research; care of experimental animals; analysis of food, body fluids, animal tissues. (Prerequisites: Analytical Chemistry and Biochemistry.)
- 739. Thesis Research.** Credit 3(0-6)
(Formerly F&N 1899)
Research problems in food and nutrition.
Students would take advanced courses in journalism, statistics, chemistry, biology, and other areas related to food and nutrition to satisfy the needs of their chosen specialization.

COURSES IN FOOD ADMINISTRATION**Undergraduate**

- 344. Institution Organization and Management I.** Credit 3(3-0)
(Formerly IM 1924)
A study of the organization, management and administration of food service establishments.
- 345. Institution Organization and Management II.** Credit 3(3-0)
(Formerly IM 1925)
A continuation of IM 344 with emphasis on personnel management.
- 346. Institution Purchasing.** Credit 4(3-2)
(Formerly IM 1946)
A study of the problems involved in the purchase of food and other expendable supplies for food service establishments.

- 447. Institution Equipment.** Credit 5(3-4)
(Formerly IM 1947)

A study of the selection, care and use of equipment for quantity food preparation and service. Interpretation of blueprints and specifications will be considered.

- 448. Quantity Cookery.** Credit 4(1-6)
(Formerly IM 1948)

The application of the principles of cookery to the preparation and service of food for group feeding with emphasis on menu planning, work schedules, cost and portion control. Prerequisite: F&N 130.

- 540. Catering.** Credit 3(1-4)
(Formerly IM 1950)

Designed to improve skill and technique in the preparation of specialty dishes and in planning, preparing and serving for entertainments. Consideration will be given to the foreign influence of gourmet cookery. Prerequisite: F&N 130 or consent of instructor.

- 544. Field Experience in Food Administration.** Credit 3(0-6)
(Formerly IM 1964)

Individualized experiences in off-campus food service establishments.

- 549. Advanced Quantity Cookery.** Credit 3(2-2)
(Formerly IM 1949)

Continuation of IM 448.

Advanced Undergraduate and Graduate

- 645. Special Problems in Food Administration.** Credit 2(0-4)
(Formerly IM 1975)

Individual work on special problems in food administration.

- 646. Readings in Food Administration.** Credit 1(1-0)

A study of food administration through reports and discussion of articles in current trade periodicals and scientific journals.

- 647. Seminar in Food Administration.** Credit 1(1-0)
(Formerly IM 1977)

Discussion of problems involved in the organization and management of specialized food service areas.

COURSES IN HOME ECONOMICS

Undergraduate

- 101. Introduction to Home Economics.** Credit 1(1-0)
(Formerly HEc 1801)

A course designed to assist students in making personal adjustments to college living; an introduction to the broad areas of home economics; a study of the home economics curricula and professional opportunities in the field.

- 104. The Individual and His Family.** Credit 2(2-0)
(Formerly HEc 1804)

A study of the interrelationships of the individual and his family throughout the life cycle with emphasis on health as it is related to the well-being of the family.

- 105. Social Usage.** Credit 1(1-0)
(Formerly HEc 1805)

A course intended for the person who desires to enrich living with graciousness and accepted standards in our present day society.

- 301. Health and Home Nursing.** Credit 2(2-0)

Principles and attitudes in home care of the sick, the handicapped, and the aged; prevention of illness and promotion of health; prenatal care; prevention of home accidents.

- 400. Contemporary Housing.** Credit 3(2-2)
(Formerly HEc 1920)

A study of problems in house planning to meet family needs. Emphasis is placed on the study of house designs, methods of financing and location.

- 401. Marriage and Family Relations.** Credit 3(3-0)
(Formerly HEc 1941)

A study of the interpersonal relationships in contemporary family life; emphasis on the changing nature of family adjustments, goals, values, and roles.

- 403. Consumer Problems.** Credit 3(3-0)
(Formerly HEc 1940)

Basic principles involved in managing personal and family finances with emphasis on buying and consumption practices.

- 500. Demonstration Techniques.** Credit 3(1-4)
(Formerly HEc 1960)

The application of demonstration techniques to all phases of home economics.

- 502. Household Equipment.** Credit 2(1-2)
(Formerly HEc 1942)

The application of principles and techniques relating to selection, care and use of household equipment.

- 503. Interior Design.** Credit 2(1-2)
(Formerly HEc 1943)

A study of residential interiors with emphasis on art principles and their relationship to furniture styles and accessories in decorating the home.

- 504. Home Furnishings.** Credit 2(1-2)
(Formerly HEc 1944)

A study of the problems in home furnishings with emphasis on the selection, care, use and practical ways of making the home attractive.

- 505. Home Management Residence.** Credit 3(1-4)
(Formerly HEc 1945)

Designed to give students experiences in applying the principles of management and interpersonal relations to group living. Prerequisites: HEc 403 and F&N 331 or concurrent.

Advanced Undergraduate and Graduate

- 602. Adult Education in Home Economics.** Credit 3(3-0)
(Formerly HEc 1972)

An overview of adult homemaking education: organization, program planning, teaching techniques and evaluation. Laboratory experience will be provided by working with out-of-school groups.

- 603. Special Problems in Home Economics I.** Credit 3(1-4)
(Formerly HEc 1973)

Problems in the various areas of home economics may be chosen for individual study.

- 604. Seminar in Home Economics Education.** Credit 2(2-0)

Consideration of problems resulting from the impact of social change on the various fields of home economics in relation to the secondary school vocational homemaking programs.

- 605. Home Economics Summer Study Abroad.** Credit 6(0-12)
(Formerly HEc 1975)

A course designed to provide opportunity for students and specialists to study historic and contemporary points of interest abroad. Exposure to customs, cultures and industries in an international setting will provide the basis for broader background and experience in selected areas of home economics.

Graduate

- 706. Special Problems in Home Economics II.** Credit 3(3-0)
(Formerly HEc 1986)

A study of research and major contemporary issues with consideration of their impact on trends and new directions in home economics.

DEPARTMENT OF PLANT SCIENCE AND TECHNOLOGY

SAMUEL J. DUNN, *Chairman*

The program in this department are designed to give the students broad scientific and technical training which will enable them to take advantage of the many job opportunities available in these fields. There is considerable flexibility in the various programs to allow for a choice of electives which may better serve the individual needs of the students.

The department offers training that is especially attractive to prospective majors who have aptitudes in science and technology and who desire to apply their training in the pursuit of careers in Modern Agricultural Science and Technology or to train further at the graduate level.

Majors in Agricultural Science or Agricultural Technology may elect options in (1) Agronomy with emphasis on Crop Science or Soil Science, (2) Horticulture, or (3) Agricultural Engineering by following the appropriate curriculum outlined in the catalog.

PROGRAM FOR AGRICULTURAL SCIENCE MAJORS

Freshman Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Education 100.....	1	—
English 101, 102.....	3	3
History 100, 101.....	3	3
Botany 140, Zoology 160	4	4
*Mathematics 111, 113	4	4
Agricultural Education 101, 102	1	1
Air or Military Science or (Elective)	1	1
	<hr/> 15	<hr/> 15

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Humanities 200, 201	3	3
Chemistry 101, 102	4	4
Agricultural Engineering 113; Animal Science 301	3	3
Plant Science 110	1	1
Poultry Science 317	3	3
Health Education	2	—
Air or Military Science or (Elective)	2	2
	<hr/> 18	<hr/> 16

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Chemistry 221, 222	3	3
*Physics 211, 212.....	4	4
Soil Science 338	—	4
Economics 301	—	3
*Electives (Major Area).....	6	2
Electives.....	5	2
	<hr/> 18	<hr/> 18

* The 30 credits required as major electives are to be taken such that: 12 credits are elected from supporting courses; 18 credits are elected from the area of concentration with approval of the advisor.

** Agric. Engr. Majors.—Math 110, 116, 117
—Physics 221, 222

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Mathematics 224.....	—	3
Agricultural Economics 330	3	—
Bacteriology 121.....	4	—
*Electives (Major Area).....	9	12
	—	—
	16	15

Supporting Courses

Mechanical Engineering 101, 102, 300; Mathematics 211, 222.
Bacteriology 421; Botany 430, 433, 530; Chemistry 221, 222, 331, 441, 442.
Zoology 461, 466, 561; Agricultural Economics 332; Chemistry 222, 251.
Economics 302, 401, 501, 415, 310; Mathematics 221, 222.

COURSES IN PLANT SCIENCE

Undergraduate

110. Plant Science I.
(Formerly 1400)

Credit 3(2-2)

An introduction to the basic principles underlying the production of economic crops.
(Prerequisite Bot. 140)
203. General Forestry
(Formerly 1412)

Credit 3(2-2)

History, classification, culture, and utilization of native trees, with special emphasis on their importance as a conservation resource and the making of national forestry policy. (Prerequisite: Botany 140)
300. Plant Science II.
(Formerly Plant Science 1420)

Credit 3(2-2)

History, classification, culture and utilization of economic plants; basic physical, economical and social conditions relating to their growth, distribution and improvement. (Prerequisite Pl. Sc. 338.)
520. Seminar in Plant Science and Technology.
(Formerly 1460)

Credit 1(1-0)

Current problems in Plant Science and Technology. Designed especially for unifying the three major areas of the department by involving both the staff and junior and senior students.

* The 30 credits required as major electives are to be taken such that: 12 credits are elected from supporting courses; 18 credits are elected from the area of concentration with approval of the advisor.

COURSES IN AGRICULTURAL ENGINEERING**Undergraduate****113. Basic and Graphics Drawing. Credit 3(0-6)**

Lettering, use of instruments, multi-view projection drawing, auxiliary projection, selection views and dimensioning, and basic structural drawing to include the phases of working drawings.

114. Agricultural Construction and Maintenance. Credit 3(1-4)
(Formerly 1404)

Selection, sharpening, care and correct use of shop tools and equipment; woodwork and simple carpentry; sheet metal work; elementary forge work; electric arc and oxyacetylene welding; pipe fitting and simple plumbing repairs.

303. Field Machinery. Credit 3(1-4)
(Formerly 1423)

Principles, operation, adjustment and maintenance of farm field machinery.

304. Structures and Environment. Credit 3(1-4)
(Formerly 1424)

Fundamentals of building construction, applied to location, selection of materials, foundations and planning farm structures. (Prerequisite Ag. Engr. 113.)

401. Surveying, Drainage, and Soil Conservation. Credit 3(1-4)
(Formerly 1441)

Principles of surveying, drainage, planning of soil erosion and drainage systems, based on topographical and soil requirements, and soil conservation practices. (Prerequisites Soil Sc. 338; Math. 111.)

402. Farm Power. Credit 3(1-4)
(Formerly 1442)

Principles of mechanical power, use, care and adjustment of internal combustion engines. (Prerequisite Physics 225.)

522. Dairy Engineering. Credit 3(1-4)
(Formerly 1462)

The general engineering principles of power selection, installation and maintenance, refrigeration and heat transfer as they apply to equipment used in the dairy industry. Also plant arrangement and management for dairy science majors.

523. Electric Power. Credit 3(1-4)
(Formerly 1463)

The study of electricity, electrical wiring, and electrical devices including motors, with particular emphasis upon the relation of these to the home and farm. (Prerequisite Physics 201, 225.)

524. Water Supply and Sanitation for the Farm and Home. Credit 3(1-4)
(Formerly 1464)

The planning and installation of farm water and sanitation systems. (Prerequisites Ag. Engr. 113 and 114; Bact. 121.)

- 525. Farm Shop Organization and Management.** Credit 3(1-4)
(Formerly 1465)

A course designed for prospective and in-service teachers of vocational agriculture; includes presentation of purpose, plans and equipment of shops, organization of course of study and methods of teaching. (Prerequisites Ag. Engr. 114; Ag. Ed. 501.)

Advanced Undergraduate and Graduate

- 600. Conservation, Drainage and Irrigation.** Credit 3(1-4)
(Formerly 1475)

Improvement of soil by use and study of conservation practices, engineering structures, and irrigation systems. (Prerequisite Ag. Engr. 401.)

- 601. Advanced Farm Shop.** Credit 3(1-4)
(Formerly 1476)

Care, operation and maintenance of farm shop power equipment. (Prerequisite Ag. Engr. 114.)

- 602. Special Problems in Agricultural Engineering.** Credit 3(0-6)
(Formerly 1477)

Special work in Agricultural Engineering on problems of special interest to the student. Open to seniors in Agricultural Engineering.

COURSES IN CROP SCIENCE

Undergraduate

- 307. Forage Crops.** Credit 3(2-2)
(Formerly 1427)

Grasses, legumes and other plants and their uses as hay, pasture, silage and special purpose of forages, identification of plants and seeds and study of quality in hay, silage and pasture population. (Prerequisite Plant Science 110.)

- 405. Determining Crop Quality.** Credit 4(2-4)
(Formerly 1445)

The recognition of high quality crop products as influenced by growth and maturity factors, weeds and diseases, determination of commercial quality through study land use and grades; identification of crops, planning crop exhibits. (Prerequisite Plant Science 300.)

Advanced Undergraduate and Graduate

- 603. Plant Chemicals.** Credit 3(2-2)
(Formerly 1478)

A study of the important chemical pesticides and growth regulators used in the production of economic plants. (Prerequisites Chem. 102 and Pl. Sc. 300.)

- 604. Crop Ecology.** Credit 3(3-0)
(Formerly 1479)

The physical environment and its influence on crops; geographical distribution of crops.

- 605. Breeding of Crop Plants.** Credit 3(2-2)
(Formerly 1480)

Significance of crop improvements in the maintenance of crop yields; application of genetic principles and techniques used in the improvement of crops; the place of seed certification in the maintenance of varietal purity.

- 606. Special Problems in Crops.** Credit 3(3-0)
(Formerly 1481)

Designed for students who desire to study special problems in crops. Repeatable for a maximum of six credits. By consent of instructor.

- 607. Research Design and Analysis.** Credit 3(2-2)
(Formerly 1482)

Experimental designs, methods and techniques of experimentation; application of experimental design to plant and animal research; interpretation of experimental data. (Prerequisite Ag. Econ. 644, Math. 224.)

COURSES IN EARTH SCIENCE

Undergraduate

- 201. The Earth—Man's Environment.** Credit 3 (2-2)

A study of the earth's physical environment as related to climate, natural resources and physiography. The interrelationship of man with the earth's environment as revealed in the modification of natural processes. No prerequisite.

- 309. Elements of Physical Geology.** Credit 3(2-2)
(Formerly 1429)

Relation of geologic principles in the development of a balanced concept of the earth and earth history; identification of rocks and minerals; weathering, water and mineral resources; sediments, metamorphosis and volcanism; land forms. (Prerequisites Chem. 101 or consent of instructor.)

- 330. Elements of Weather and Climate.** Credit 3(2-2)
(Formerly 1430)

A study of the fundamental elements of weather conditions as revealed in world patterns of climatic types. This course surveys the types of land forms and make applications to problems in engineering, military science and in planning for agricultural, urban and regional development projects. (Prerequisites E. Sc. 309; Soil Sc. 338, or consent of instructor.)

- 408. Aerial Photointerpretation.** Credit 3(1-4)
(Formerly Earth Science 343)

The interpretation of aerial photography as an aid to the study of terrains of all types. This course surveys the types of land forms and makes applications to problems in engineering, military science and in planning for agricultural, urban and regional developmental projects. (Prerequisites Ea. Sc. 1429; Soil Sc. 1438 or consent of instructor.)

COURSES IN HORTICULTURE**Undergraduate**

- 118. Amateur Floriculture.** Credit 3(2-2)
(Formerly 1408)

General principles of growing flowers on a small scale in small greenhouses, home, school and public buildings; growing flowers outside for landscape effect and cutting.

- 119. The Functional Usage of Plant Materials.** Credit 3(0-6)

The use of plants and related materials to enhance temporary settings with emphasis on the utilization of horticultural plant materials indoor and out-of-doors. Special attention to be given to temporary gardens, planters, interior scenes and designs. (No prerequisite).

- 334. Plant Propagation.** Credit 3(2-2)
(Formerly 1434)

Study of types, construction, and management of propagation structures; fundamental principles of propagation by seed, cuttage, budding, grafting, and layerage. (Prerequisite Pl. Sc. 110.)

- 335. Principles of Landscape Design.** Credit 3(2-2)
(Formerly 1433)

Fundamentals of design of planning the arrangement of small properties, such as homes, schools, small parks and playgrounds.

- 514. Nursery Management.** Credit 3(2-2)
(Formerly 1454)

Planning, operations and methods used by wholesale, retail, and landscape nurseries. Emphasis on cultural practices, records and selling techniques. (Prerequisite Hort. 334.)

- 527. Basic Floral Design.** Credit 3(1-4)
(Formerly 1467)

Essentials of flower arrangement and plant decorations for the home, office, hospital, school and church.

- 528. Flower Shop Management.** Credit 3(2-2)
(Formerly 1468)

Designing, planning, handling of merchandise, buying and selling methods, and general policies.

- 529. Landscape Design and Construction.** Credit 3(0-6)
(Formerly 1469)

Problems in design of land areas with emphasis on orientation, arrangement, and circulation. Instruction in planning, presentation, cost accounting, and construction. (Prerequisites Hort. 335; Ag. Engr. 113.)

- 530. Landscape Design and Construction.** Credit 3(0-6)
(Formerly 1470)

Continuation of Hort. 530. Problems in design of larger land areas involving more complex features; practice in landscape model construction. (Prerequisite Hort. 529.)

Advanced Undergraduate and Graduate

- 608. Special Problems.** Credit 3(3-0)
(Formerly 1483)

Work along special lines given largely by the project method for advanced undergraduate and graduate students who have the necessary preparation.

- 610. Commercial Greenhouse Production.** Credit 3(2-2)
(Formerly 1449)

Culture of floriculture crops in the greenhouse and out-of-doors with emphasis on out flowers and outside bedding plants. Special attention given to seasonal production. (Prerequisite Hort. 334.)

- 611. Commercial Greenhouse Production.** Credit 3(2-2)
(Formerly 1450)

Culture of floriculture crops in the greenhouse with emphasis on pot plant and conservatory plants. Special attention given to seasonal production. (Prerequisite Hort. 334.)

- 612. Plant Materials and Landscape Maintenance.** Credit 3(2-2)
(Formerly 1452)

Identification, merits, adaptability, and maintenance of shrubs, trees, and vines used in landscape planting trees, shrubs, bulbs, and perennials. (Prerequisite Hort. 334, 335.)

- 613. Plant Materials and Planning Design.** Credit 3(2-2)
(Formerly 1453)

Continuation of Hort. 512 with added emphasis on plant combinations and use of plants as design elements. (Prerequisite Hort. 512.)

COURSES IN SOIL SCIENCE**Undergraduate**

- 338. Fundamentals of Soil Science.** Credit 4(2-4)
(Formerly 1438)

The fundamental nature and properties of soils and introductory treatment of soil genesis, morphology, and classification and land use.

- 516. Soil Pedology.** Credit 3(3-0)

Factors and processes in soil formation and the general principles upon which the classification of soils is based. This course will be offered during the fall terms of odd numbered years, beginning in 1967. (Prerequisites: Soil Science 338 and Chemistry 102.)

- 517. Soil Fertility.** Credit 3(3-0)
(Formerly 1457)

General principles of fertility; the physical, chemical, and biological factors affecting soil fertility, crop production, conservation cropping, and crop rotations. (Prerequisites Soil Sc. 338; Chem. 101 or consent of instructor.)

- 518. Soil Fertility Laboratory.** Credit 2(0-4)
(Formerly 1458)

Analytical and diagnostic procedures in studying soil fertility problems. (Prerequisites Chem. 102; Soil Sc. 338 and 517 or consent of instructor.)

532. Soil Physics.

Credit 4(2-4)

A study of the influence of mineralogical composition and texture, and temperature, aeration and moisture relations of the soil on its physical condition. This course will be offered during the spring terms or even numbered years, beginning in 1968. (Prerequisites: Soil Science 517, Chemistry 102, Mathematics 113, and Physics 225.)

533. Soil Genesis and Classification.

Credit 4(2-4)

(Formerly 1473)

Soil genesis, morphology and classification of the major soil groups of the United States; techniques of making and using soil surveys. (Prerequisites: Soil Sc. 336 and 516.)

534. Soil Chemistry.

Credit 4(2-4)

Application of physico-chemical principles to soil studies including crystal structure, types of bonding, nutrient fixation, ionic equilibria and electrode. (Prerequisites: Chem. 102, Soils 338, and the consent of the instructor.) This course will be taught during the Spring Semester of years ending with an odd number.

ADVANCED UNDERGRADUATE AND GRADUATE**609. Special Problems in Soils.**

Credit 3(3-0)

(Formerly 1484)

Research problems in soils for advanced students. (By consent of instructor.)

GRADUATE COURSE IN CROP SCIENCE**702. Grass Land Ecology.**

Credit 3(3-0)

(Formerly 1491)

GRADUATE COURSES IN EARTH SCIENCE**704. Problem Solving in Earth Science.**

Credit 3(0-6)

(Formerly 1493)

705. The Physical Universe.

Credit 3(3-0)

(Formerly 1494)

706. Physical Geology.

Credit 3(3-0)

(Formerly 1495)

708. Conservation of Natural Resources.

Credit 3(3-0)

(Formerly 1496)

709. Seminar In Earth Science.

Credit 3(3-0)

(Formerly 1497)

GRADUATE COURSE IN SOILS**710. Soils of North Carolina.**

(Formerly Soils 1499)

COOPERATIVE EXTENSION

R. E. JONES, *Associate Dean*

The program in Cooperative Extension Service at the North Carolina Agricultural and State University is a cooperative undertaking between the U. S. Department of Agriculture and the Cooperative Extension Service—State of North Carolina. Activities are supported by federal funds under the Smith-Lever Act of 1914, as amended. Under this arrangement the Cooperative Extension Service serves as an out-reach function of the university where emphasis is placed on (1) agriculture and resource management, (2) Family Living and Human Resource Development, (3) 4-H and Youth Development.

COOPERATIVE RESEARCH

H. F. ROBINSON, *Director, Research Administration*

The North Carolina Agricultural and Technical State University conducts basic and applied research in the interest of agriculture and rural North Carolina. This research is supported by annual appropriations of federal funds under PL 89-106 administered through the U. S. Department of Agriculture. The research is directed at objectives in agricultural sciences and technology, in home economics, in the natural sciences, and socio-economic fields related to agriculture and problems of rural North Carolina.

SCHOOL OF ARTS AND SCIENCES



SCHOOL OF ARTS AND SCIENCES

ARTHUR F. JACKSON, *Dean*

The School of Arts and Sciences is concerned primarily with providing experiences which seek to develop a student's ability to engage in analytical and critical inquiry, and with the enlargement of a student's understanding of the significant accomplishments of the human mind as they may be viewed in the humanities, the social sciences, and the natural sciences. The objectives of this school are:

1. to provide courses of instruction to all students of the University in general or basic education;
2. to provide formal instruction in breadth and in depth in specific curriculum areas;
3. to provide experiences which seek to develop the student's ability to engage in analytical and critical thought;
4. to provide activities which allow the student to acquire knowledge concerning the significant accomplishments in the humanities, social sciences, natural sciences, and mathematics; and
5. to provide the opportunity for individual creativity and development through undergraduate participation in research activities and special problems.

These objectives are reached via the provision of courses of study which require each student to experience a wide range of general education subjects. The School allows the student to gain in-depth experiences in a specific discipline through specific major sequences. To that end, the School offers majors in Art, Biology, Chemistry, Economics, English, French, History, Mathematics, Music, Physics, Political Science, Social Studies, Social Service, Sociology and Speech and Dramatic Arts. A Bachelor of Science degree is offered in each of these areas. Many degree programs may be pursued jointly with Professional Education courses (offered by the School of Education) which qualify graduates for certification to teach in the secondary schools. In addition, the Physics and Mathematics Departments provide joint degree curricula in Engineering Physics and Engineering Mathematics, respectively, with the School of Engineering.

The School of Arts and Sciences, together with other Schools of the University, seeks to stimulate and guide young people into constructive intellectual and social maturity. This function is carried through by many associations in the classroom, the laboratory, the seminar, and the conference. In addition to its promulgation of the vital process of teaching through dynamic communication, the School of Arts and Sciences places high importance on its role to provide the University with a depository of knowledge. In keeping with this purpose, the School fosters special library collections; it operates the University Art Gallery; it serves as the main fostering source for the Center for African and Afro-American Studies, and it provides significant experiences in the performing arts for students whose talents may be displayed and developed through the several curricula of the School.

In order to stimulate academic excellence in many of the subject matter areas of the School's curricula, honorary societies appropriate to these areas of concentration exist on the campus. Recognition for academic achievement holds a significant place in the on-going program of the School of Arts and Sciences.

Admission requirements for the School of Arts and Sciences are the same as those for the University. Requirements for graduation vary from department to department so the student must satisfy departmental requirements.

In an effort to afford students more options and flexibility in educational planning, the School has developed a set of general education requirements from which students

may choose during the first two years. Sixteen (16) courses may be chosen from among the fields listed below within the limits specified.

- I. English Composition (2 courses—Required)
- II. Science (Natural and Physical) (4 courses) include Chemistry, Biology, Mathematics, Physics, Botany, Biology, Zoology, and Earth Science.
- III. Foreign Languages (2 courses)
These include French, Spanish, German, Russian and Computer Programming.
- IV. Science (Social and Behavioral) (4 courses)
These include Anthropology, Economics, Geography, History, Political Science and Sociology.
- V. The Humanities (4 courses)
These include Art, English, Humanities, Music, Philosophy and Speech.

Those courses in the catalogue which are preceded by an asterisk may be used to satisfy these requirements.

Certain majors require specific prerequisites, therefore, each student should select courses with this fact in mind.

Individuals planning to enter teaching fields should be aware of the semester hour requirements.

(Satisfactory advanced placement scores or comparable experiential evidence may be used to satisfy any aspect of these requirements)

COURSE SELECTION LIST—GENERAL EDUCATION REQUIREMENTS

(Sixteen courses may be selected from among the following fields within the limits specified)

- I. English (2 courses—Required)
English 100, Freshman Composition
English 101, Freshman Composition
- II. Sciences (Physical, Biological, Mathematical)
(4 courses)
Chemistry 100, Physical Science
Chemistry 101, General Chemistry I
Chemistry 102, General Chemistry II
Biology 100, Biological Science
Botany 140, General Botany
Mathematics 101, Freshman Mathematics I
Mathematics 102, Freshman Mathematics II
Mathematics 111, College Algebra & Trigonometry
Mathematics 113, Analytical Geometry & Calculus
Physics 200, Introduction to Physics
Physics 201, Survey of Physics
Physics 221, General Physics I
Physics 222, General Physics II

Physics 225, College Physics I
Physics 226, College Physics II
Physics 250, Introduction to Astronomy
Zoology 160, General Zoology
Earth Science 309, Elements of Physical Geology
Earth Science 330, Elements of weather and climate
Earth Science 201, The Earth Man's Environment

III. Foreign Languages (2 courses)

French 100, Elementary French
French 101, Elementary French
French 300, Intermediate French
French 301, Intermediate French
Spanish 104, Elementary Spanish
Spanish 105, Elementary Spanish
Spanish 320, Intermediate Spanish
Spanish 321, Intermediate Spanish

IV. Sciences (Social and Behavioral)
(4 courses)

Anthropology 200, Introduction to Anthropology
Economics 301, Principles of Economics I
Economics 302, Principles of Economics II
Geography 210, World Regional
History, 100, History of Western Civilization I
History 101, History of Western Civilization II
History 105, History of Africa
History 107, Religions and Civilizations
History 109, Afro-American Studies
History 110, Blacks in the Western Hemisphere
Political Science 260, Introduction to Political Science
Sociology 203, Principles of Sociology

V. The Humanities (4 courses)

Art 100, Basic Drawing & Composition
Art 101, Lettering and Poster Design
Art 220, Graphic Presentation I
Art 221, Graphic Presentation II
English 220, English Literature I
English 221, English Literature II
English 430, American Literature I
English 431, American Literature II
English 629, The Negro Writer in American Literature
Humanities 200, Survey of Humanities I
Humanities 201, Survey of Humanities II
Music 404, History & Appreciation of Music
Music 405, Music of the Baroque & Romantic Periods
Music 406, Romantic Music
Philosophy 260, Introduction to Philosophy
Philosophy 261, History of Philosophy
Philosophy 262, Logic
Speech 250, Speech Fundamentals
Speech 251, Public Speaking
Speech 252, Argumentation & Debate
Speech 253, Parliamentary Procedure

Dependent upon career choices students in the School of Arts and Sciences should select combination of courses during the first two years as suggested by the samples below.

Freshman Year

<i>Area</i>	<i>Number of Courses</i>
English	2
Mathematics	2
Physical or Biological Science	2
Social Science	2
Physical Education	2

Sophomore Year

Foreign Languages or Computer Languages	2
Humanities	4
Social Sciences	2

DIVISION OF HUMANITIES

- **DEPARTMENT OF ART**
- **DEPARTMENT OF ENGLISH**
- **DEPARTMENT OF FOREIGN LANGUAGES**
- **DEPARTMENT OF MUSIC**
- **DEPARTMENT OF SPEECH COMMUNICATION AND
THEATER ARTS**

DEPARTMENT OF ART

LEROY F. HOLMES, JR., *Chairman*

The objectives of the Art Department are to guide the student through classroom, studio, and working experiences; to develop his aesthetic perceptivity, technical competency; and to broaden his general education.

Beginning with the belief that human beings are creative; that this creative impulse can serve human needs, and an art curriculum can motivate and nourish the development of creative ability, the art curricula seek to embrace and utilize both functional and experimental approaches in the development of that creative ability. This philosophy is reflected in three areas of concentration—Art Education, Design, and painting.

The four-year programs leading to the Bachelor of Science Degree in Art integrate studio major and academic courses. The fundamentals of art coupled with courses outside the area of art enrich and broaden the comprehension of creative experience and lay a foundation for the pursuit of graduate study, for careers as creative artists, or teachers.

In the advanced studio courses, students may expect to purchase certain materials which are not supplied by the Art Department. These materials may cost from \$5.00 to \$45.00 depending on the course taken by the students.

REQUIRED COURSES FOR ART MAJORS

DESIGN OPTION

Major Content Courses

<i>Course Number</i>	<i>Credit Hours</i>	<i>Course Title</i>
ART 100	3	Basic Drawing and Composition
ART 101	3	Lettering and Poster Design
ART 222	3	Watercolor
ART 224 *	2	Art Appreciation
ART 225 *	2	An Introduction to the History of Art
ART 226	3	Design I
ART 227	3	Design II
ART 228	3	Color Theory
ART 229	3	Anatomy and Figure Drawing
ART 400 *	2	Renaissance Art
ART 401	3	Ceramics
ART 402	3	Basic Sculpture
ART 405	3	Materials and Techniques
ART 406	3	Painting Techniques
ART 455	3	Fabric Design and Basic Weaving
ART 456	3	Fabric Painting and Weaving
ART 459 *	2	Baroque and Rococo Art
ART 520 *	2	Modern Art
ART 524	3	Introduction to Graphic Arts
ART 525	3	Lithography and Serigraphy
ART 526	3	Senior Project

* Indicates art courses which can satisfy general education requirements

Other Requirements

Mechanical Engineering 101	2	Engineering Graphics
French or German	6	
Electives	21	

PAINTING OPTION

SAME AS DESIGN EXCEPT ART 528 and 529 ARE SUBSTITUTED FOR ART 455 and 456.

TEACHING OPTION

Major Content Courses

<i>Course Number</i>	<i>Credit Hours</i>	<i>Course Title</i>
ART 100	3	Basic Drawing and Composition
ART 101	3	Lettering and Poster Design
ART 224	2	Art Appreciation
ART 225	2	An Introduction to the History of Art
ART 226	3	Design I
ART 227	3	Design II
ART 229	3	Anatomy and Figure Drawing
ART 400	2	Renaissance Art
ART 401	3	Ceramics
ART 405	3	Materials and Techniques
ART 454	3	General Crafts
ART 459	2	Baroque and Rococo Art
ART 520	2	Modern Art
ART 524	3	Introduction to Graphic Arts
ART 600	3	Public School Art

Other Requirements

Satisfactory completion of general requirements specified for certification

COURSES IN ART**Undergraduate**

- 100. Basic Drawing and Composition.** Credit 3(0-6)
(Formerly Art 3200)

A study of the fundamental principles of drawing as a mode of visual expression. Selected problems involving basic consideration of line, form, space and composition are presented for analysis and laboratory practice.

- 101. Lettering and Poster Design.** Credit 3(0-6)
(Formerly Art 3201)

A comprehensive study of the art of lettering. Projects involving the principles of layout, poster construction, and general advertising.

- 220. Graphic Presentation I.** Credit 2(0-4)
(Formerly 3220)

Exercises in various sketching techniques and media, including work with pencil, charcoal, crayon, and ink. Individual instruction is given using forms in nature and still life for art and architectural presentation. Prerequisite: Sophomore Classification.

221. Graphic Presentation II. Credit 2(0-4)
(Formerly 3221)

The theory of color mixture. Individual instruction in the techniques of watercolor painting for architectural presentation. Studies from nature and still-life. Prerequisite: Art 220.

222. Watercolor. Credit 3(0-6)
(Formerly Art 3222)

Experimental exploration of all aqueous media: watercolor, casein, gouache their possibilities and limitations.

224. Art Appreciation. Credit 2(2-0)
(Formerly Art 3224)

An introduction to the study of art. Basic qualities of various forms of artistic expression are explained. Emphasis is placed on the application of art principles in every day life.

225. An Introduction to the History of Art. Credit 2(2-0)
(Formerly Art 3225)

A general introduction to the history of art, beginning with an examination of ancient art in terms of their extant monuments and culminating with the analysis and comparison of representative works of today.

226. Design I. Credit 3(0-6)
(Formerly Art 3226)

An introduction to visual design based upon an analysis of the aims, elements, principles, sources of design and their application in a variety of media.

227. Design II. Credit 3(0-6)
(Formerly Art 3227)

A continuation of Art 226 with consideration given to three dimensional as well as two dimensional problems. Students are encouraged in the experimental use of materials and are required to find individual and complete solutions to problems through various stages of research, planning, and presentation. Emphasis is placed on technical perfection and the development of professional attitudes.

228. Color Theory. Credit 3(0-6)
(Formerly 3228)

Problems directed toward understanding of color through creative experiment and application of color in visual organization. Use of slides, filmstrips, and trips.

229. Anatomy and Figure Drawing. Credit 3(0-6)
(Formerly Art 3229)

A study of the human figure with emphasis on anatomy, body structure and proportions, draped figures at rest and in action. Special emphasis is given to detailed studies, composition, and stylization.

400. Renaissance Art. Credit 2(2-0)
(Formerly Art 3240)

The study of the Renaissance in Italy and in major regions of northern and western Europe from 1300 to 1600.

401. Ceramics. Credit 3(0-6)
(Formerly Art 3241)

Introduction to basic techniques and processes of making ceramics. The student is taught hand building, slip casting, one piece molds, wheel throwing, decorating, glazing, and firing. Supplementary reading is required.

402. Basic Sculpture. Credit 3(0-6)
(Formerly 3242)

Introduction to sculptural form with the use of clay modeling, basic plaster techniques, wood, and metal in relation to the production of sculpture.

403. Jewelry and Metalwork. Credit 3(0-6)
(Formerly 3243)

The design and technical essentials of jewelry making and metalwork. Prerequisites: Art 226, 227.

405. Materials and Techniques. Credit 3(0-6)
(Formerly 3245)

A study of the materials of the artist; supports, grounds, vehicles, binders, and protective covering. Exploration of the possibilities of various techniques of picture construction as a point of departure for individual expression.

406. Painting Techniques. Credit 3(0-6)
(Formerly 3246)

A continuation of 3245 with further work in projects that explore the esthetic opportunities and problems implicit in the use of varying media. Work in tempera, gouache, casein, polymers and lacquers.

450. Advertising Design I. Credit 3(0-6)
(Formerly 3250)

The study of basic tools of advertising design. Students are introduced to lettering techniques, layout problems, and reproduction processes for advertising, illustrations, posters, and television.

451. Advertising Design II. Credit 3(0-6)
(Formerly 3251)

Preparation and rendering of art work for reproduction from rough idea layouts to finished illustration. Creative and technical class work is augmented by visits to commercial studios and printing companies. Prerequisite: Art 450.

452. Commercial Art. Credit 3(0-6)
(Formerly Art 3252)

Illustration techniques. Different materials and renderings employed in advertising illustration, such as airbrush, colored inks, scratch board, etc. Attention is given to techniques of printing in as far as they affect graphic design.

453. Typography. Credit 3(0-6)
(Formerly 3253)

The study of typography in relation to lettering, advertising, and design. Prerequisites: Art 101 and 450.

454. General Crafts. Credit 3(0-6)
(Formerly Art 3254)

Introduction to craft processes, weaving, metalwork, leather, etc.

455. Fabric Design and Basic Weaving. Credit 3(0-6)
(Formerly 3255)

Basic principles of design as related to textiles and other flat surface decoration. The warping, threading, and weaving on small looms. History of fabric design and weaving. Prerequisites: Art 226, 227.

456. Fabric Painting and Weaving. Credit 3(0-6)

The emphasis is on printing techniques and designers' tools to achieve effective results and on the use of the large looms for creating interesting fabrics. Study of contemporary trends in weaving. Prerequisites: Art 226, 227, 455.

457. Stage Design and Marionette Production I. Credit 3(0-6)
(Formerly 3257)

Problems in scene design and stage settings with experiments in stage lighting. Attention is given to the designing and construction of marionettes for simple plays. Field trips and attendance at plays are required.

458. Stage Design and Marionette Production II. Credit 3(0-6)

A continuation of 457.

459. Baroque and Rococo Art. Credit 2(2-0)
(Formerly Art 3259)

The study of art in Europe from 1600 to 1800.

520. Modern Art. Credit 2(2-0)
(Formerly Art 3260)

European and American art from about 1875 to the present.

524. Introduction to Graphic Arts. Credit 3(0-6)
(Formerly Art 3264)

Introduction to printmaking processes. Production of prints in varied media: linoleum, woodcuts, drypoint, etchings, serigraphs, and lithographs.

525. Lithography and Serigraphy. Credit 3(0-6)
(Formerly 3265)

Exploration of the techniques of lithography and serigraphy as a means of contemporary artistic expression. Emphasis of medium determined by individual interest.

526. Senior Project. Credit 3(0-6)
(Formerly 3266)

Students who have given evidence of their ability to do serious individual work on a professional level may plan and carry out a project of his own choosing, subject to approval and supervision of a faculty member.

528. Painting I. Credit 3(0-6)
(Formerly Art 3268)

Creative painting in various media with emphasis on a modern approach and handling of medium. Research and experience in contemporary trends: abstract, non-objective, and abstract expressionism.

529. Painting II. Credit 3(0-6)
(Formerly Art 3269)

Development of the student as a professional artist; advance research and familiarization with contemporary trends, concepts, forms, and symbols. Emphasis on an original contemporary statement.

Advanced Undergraduate and Graduate

600. Public School Art. Credit 3(3-0)
(Formerly Art 3270)

Study of materials, methods, and procedures in teaching art in public schools. Special emphasis is placed on selection and organization of materials, seasonal projects, lesson plan.

- 602. Seminar In Art History.** Credit 3(3-0)
(Formerly Art 3272)

Investigation in depth of the background influences which condition stylistic changes in art forms by analyzing and interpreting works of representative personalities.

- 603. Studio Techniques.** Credit 2(0-4)
(Formerly Art 3273)

Demonstrations that illustrate and emphasize the technical potentials of varied media. These techniques are analyzed and discussed as a point of departure for individual expression.

- 604. Ceramic Workshop.** Credit 2(0-2)
(Formerly Art 3274)

Advanced studio problems and projects in ceramics with emphasis on independent creative work. The student is given opportunity for original research and is encouraged to work toward the development of a personal style in the perfection of technique.

- 605. Printmaking.** Credit 2(0-4)
(Formerly Art 3275)

Investigation of traditional and experimental methods in printmaking. Advanced studio problems in woodcut etching, lithography, and serigraphy.

- 606. Sculpture.** Credit 2(0-4)
(Formerly Art 3276)

Further study of sculpture with an expansion of techniques. Individual problems for advanced students.

- 607. Project Seminar.** Credit 2(0-4)
(Formerly Art 3277)

Advanced specialized studies in creative painting, design, and sculpture. By means of discussion and suggestions, this seminar intends to solve various problems which might arise in each work. Prerequisite: Consent of the instructor.

- 608. Arts and Crafts.** Credit 2(0-4)
(Formerly 3278)

Creative experimentation with a variety of materials, tools, and processes: projects in wood, metal, jewelry making, wood and metal construction, fabric design, leather craft, puppet making, and paper sculpture.

DEPARTMENT OF ENGLISH

JOHN O. CRAWFORD, *Acting Chairman*

The English Department assumes three responsibilities in the educational program of the institution. First, by means of composition courses, introductory courses in literature, and laboratory courses, the department attempts to develop among the students the language skills required for intelligent communication. Second, the department provides the necessary information and training for prospective teachers of English. Third, the department offers the English majors a foundation of information and of knowledge of techniques which will enable them to pursue graduate study effectively.

The Department offers courses in English language and literature, developmental reading, and the humanities. A major is offered in English. One may pursue a nonteach-

ing major in the department, as the schedules of programs on the following pages indicate. A minor is also offered in English.

All English majors are required to study a foreign language through the intermediate courses. If a student has studied a foreign language for two years in high school, he may enroll in the intermediate course when he begins the language study at the University. Such a student would be required to complete only one year of foreign language study at the University.

TEACHER EDUCATION PROGRAM in ENGLISH

The Department of English offers a Teacher Education program to prepare students to teach English in the Secondary Schools of North Carolina. Students in the program are expected to take more than the minimum requirements for certification. The Department feels that these added courses prepares the students for possible new State requirements and for graduate study.

REQUIRED COURSES FOR ENGLISH MAJORS

<i>Course No.</i>	<i>Credit Hours</i>	<i>Course Name</i>
*Eng. 100	3	Freshman Composition I
*Eng. 101	3	Freshman Composition II
*Eng. 102	1	Developmental Reading
Eng. 220	3	English Literature I
Eng. 221	3	English Literature II
Eng. 300	3	Advanced Composition
Eng. 401	3	Survey of Dramatic Literature II
Eng. 410	3	Shakespeare
Eng. 430	3	American Literature I
Eng. 431	3	American Literature II
Eng. 435	3	The Novel
Eng. 436	3	Modern Poetry
Eng. 450	3	Advanced English Grammar
Eng. 455	3	Journalism
Eng. 500	3	Literary Research
Eng. 501	3	Intro. to History of the Eng. Language
**Eng. 510	3	Reading Skills
Eng. 550	1	Senior Seminar

THE NON-TEACHING MINOR (Same as the Teaching Minor)

The scope of the English major curriculum often prevents a student from pursuing a minor; consequently, the Department recommends "strong electives" which may pattern in some of the following concentrations:

* General Education Courses

** Required only of Teaching Majors

Foreign Language

French 400	Phonetics
French 410	Oral French
French 415	Survey of Literature I
French 505	Advanced Composition

Music and Art

Music 403	History and Appreciation
Music 405	Baroque and Romantic Periods
Art 224	Art Appreciation
Art 400	Renaissance Art

Social Science

History 205	United States Since 1865
History 206	Africa South of the Sahara
Sociology 204	Social Problems
Sociology 306	Minority Problems

Library Science

Education 410	Organization and Administration of School Libraries
Education 411	Cataloging and Classification
Education 412	School Library Reference Materials
Education 413	Non-Book Materials
Education 414	Reading Interest
Education 415	Techniques of Librarianship

COURSES IN ENGLISH

100. Freshman Composition I Credit 3(3-0)
 (Formerly English 2401)

An introduction to oral and written communication; provides the student with experience in writing short compositions, outlining written material, improving reading, speaking skills.

***101. Freshman Composition II.** Credit 3(3-0)
 (Formerly English 2402)

A continuation of English 100 which provides the student with additional experience in expository writing, with intensive instruction in descriptive, argumentative writing, narrative composition; introduces student to the techniques of investigative writing and to the skills of reading different literary genres; provides opportunities for additional experience in oral expression. Prerequisite: English 100.

***102. Developmental Reading.** Credit 1(2-0)
 (Formerly English 2403)

Instruction and practice in methods of increasing rate of reading and techniques of comprehending written material; emphasis upon vocabulary study and study skills. Limited registration.

* Courses may be taken to satisfy General Education requirements

Language and Composition

- 300. Advanced Composition** Credit 3(3-0)
(Formerly English 2440)

A study of techniques of narrative, descriptive, expository, and argumentative composition. Prerequisite: English 101.

- 450. Advanced English Grammar.** Credit 3(3-0)
(Formerly English 2441)

An intensive study of the structure of the English language with tolerance towards language dialects and levels as effective communication; emphasis placed upon a knowledge of grammar essential to teaching English in the junior and senior high school. Prerequisite: English 101.

- 455. Journalism.** Credit 3(2-2)
(Formerly English 2442)

Theoretical and practical work in gathering, organizing, and writing news; primary attention to the development of journalistic technique. Prerequisite: English 101.

- 500. Literary Research.** Credit 3(3-0)
(Formerly English 2461)

OPEN ONLY TO JUNIOR AND SENIOR ENGLISH MAJORS AND MINORS.

Advanced study in the tools and techniques of literary research and investigation; emphasizes independent study and culminates in the completion of a study of a problem in literature.

- 501. Introduction of the History of the English Language.** Credit 3(3-0)
(Formerly English 2462)

A course designed to develop the student's understanding of modern English syntax, vocabulary, etymology, spelling, pronunciation, and usage and to increase the students comprehension of English literature of previous centuries through a study of the history of the language.

- 510. Reading Skills.** Credit 2(2-0)
(Formerly 2463)

Open to senior English majors and minors.

A course designed to orient students to the scope of higher-level reading skills and to the problems involved in promoting increased efficiency in reading of secondary school pupils.

Literature

- *210. Introduction to Literary Studies.** Credit 3(3-0)
(Formerly English 2463)

Required of English majors and minors in the sophomore year; open to others only with approval of instructor; the critical analysis, literary criticism, investigative and bibliographical techniques necessary to advanced study in English. This course is a prerequisite for all advanced courses in literature. Prerequisite: English 101.

- 220. English Literature I.** Credit 3(3-0)
(Formerly English 2437)

A survey of the literary movements and major authors of English literature in relation

* Courses may be taken to satisfy General Education requirements

to the cultural history of England, from Beowulf to 1700. Prerequisite: English 101, History 100-101.

221. English Literature II. Credit 3(3-0)
(Formerly English 2438)

A continuation of English 220 from 1700-1914. Prerequisite: English 101, History 100-101.

400. Survey of Dramatic Literature I. Credit 3(3-0)
(Formerly English 2450)

A survey course in the history, literature, criticism, and arts of the theatre to the nineteenth century. Prerequisite: English 210.

401. Survey of Dramatic Literature II. Credit 3(3-0)
(Formerly English 2451)

A continuation of English 400, from the nineteenth century to the present. Prerequisite: English 210.

410. Shakespeare. Credit 3(3-0)
(Formerly English 2452)

An introduction to a study of the works of William Shakespeare through a detailed examination of representative works selected from the major periods of his development as a dramatist. Prerequisite: English 210.

430. American Literature I. Credit 3(3-0)
(Formerly English 2455)

A study of the literary movements and major authors of American literature in relation to the cultural history of America from the Colonial Period to 1865. Prerequisite: English 210, Humanities 200-201.

431. American Literature II. Credit 3(3-0)
(Formerly English 2456)

A continuation of English 430, from 1865-1914. Prerequisite English 210, Humanities 200-201.

435. The Novel. Credit 3(3-0)
(Formerly English 2457)

A study of the novel as an art form, with attention to significant English and American novelists from 1750 to the present. Prerequisite: English 210.

436. Modern Poetry. Credit 3(3-0)
(Formerly English 2458)

A study of the poetry as an art form, with attention to significant English and American poets of the twentieth century. Prerequisite: English 210.

550. Senior Seminar. Credit 1(1-0)
(Formerly English 2469)

A discussion of problems in literature and composition. Required of senior English majors and minors. Prerequisite: 21 hours of English above English 101 and including English 210.

Advanced Undergraduate and Graduate

- 603. Introduction to Folklore.** Credit 3(3-0)
(Formerly 2498)

Basic introduction to the study and appreciation of folklore. (Cross listed as Anthropology 603.)

- 620. Elizabethan Drama.** Credit 3(3-0)
(Formerly 2471)

Chief Elizabethan plays, tracing the development of dramatic forms from early works to the close of the theaters in 1642. Prerequisite: English 210, 220-221.

- 621. Grammar and Composition for Teachers.** Credit 3(3-0)
(Formerly English 2472)

A course designed to provide a review of the fundamentals of grammar and composition for the elementary or secondary school teacher. (Not accepted for credit toward undergraduate or graduate concentration in English.)

- 626. Children's Literature.** Credit 3(3-0)
(Formerly English 2476)

A study of the types of literature designed especially for students in the upper levels of elementary school and in junior high school. (Not accepted for credit toward undergraduate or graduate concentration in English.) Prerequisite: Graduate standing or English 101, Humanities 200-201.

- 628. The American Novel.** Credit 3(3-0)
(Formerly English 2478)

A history of the American novel from Cooper, to Faulkner. Melville, Twain, Howells, James, Dreiser, Lewis, Hawthorne, Faulkner, and Hemingway will be included. Prerequisite: English 210.

- 629. The Negro Writer in American Literature.** Credit 3(3-0)

A study of prose, poetry, and drama by American authors of Negro ancestry. Their works will be studied in relation to the cultural and literary traditions of their times. Dunbar, Chestnutt, Johnson, Cullen, Bontemps, Hughes, Wright, Ellison, Baldwin, and Yerby will be included. Prerequisite: Graduate standing or English 101, Humanities 200-201.

Graduate

These courses are open only to graduate students.

- 700. Literary Analysis and Criticism.** Credit 3(3-0)
(Formerly 2485)

An introduction to intensive textual analysis of poetry, prose fiction, prose non-fiction, and drama. A study of basic principles and practices in literary criticism and of the various schools of criticism from Plato to Eliot.

- 702. Milton.** Credit 3(3-0)
(Formerly English 2486)

A study of the works of Milton in relation to the cultural and literary trends of seventeenth-century England. Emphasis is placed upon Milton's poetry.

704. Eighteenth Century English Literature. Credit 3(3-0)
(Formerly English 2487)

A study of the major prose and poetry writers of the eighteenth century in relation to the cultural and literary trends. Dryden, Defoe, Swift, Fielding, Addison, Pope, Johnson, and Blake will be included.

710. Language Arts for Elementary Teachers. Credit 3(3-0)
(Formerly English 2488)

A course designed to provide elementary school teachers with an opportunity to discuss problems related to the language arts taught in the elementary school. (Not accepted for credit towards concentration in English.)

720. Studies in American Literature. Credit 3(3-0)
(Formerly English 2489)

A study of major American prose and poetry writers.

750. Romantic Prose and Poetry of England. Credit 3(3-0)
(Formerly English 2490)

A study of nineteenth-century British authors whose works reveal characteristics of Romanticism. Wordsworth, Coleridge, Shelley, Keats, Byron, Lamb, Carlyle, and De Quincey will be included.

751. Modern British and Continental Fiction. Credit 3(3-0)
(Formerly English 2491)

A study of British and European novelists from 1914 until the present. Included in the study are Joyce, Kafka, Gide, Mann, and Camus.

752. Restoration and 18th Century Drama. Credit 3(3-0)
(Formerly English 2492)

A study of the theatre and drama in relation to the cultural trends of the period. Etherege, Farquhar, Vanbrugh, Congreve, Fielding, Gay, Steele, Goldsmith, and Sheridan will be included.

753. Literary Research and Bibliography. Credit 3(3-0)
(Formerly English 2493)

An introduction to tools and techniques used in investigation of literary subjects.

754. History and Structure of the English Language. Credit 3(3-0)
(Formerly English 2494)

A study of the changes in the English language-syntax, vocabulary, spelling, pronunciation, and usage from the fourteenth century through the twentieth century.

755. Contemporary Practices in Grammar and Rhetoric. Credit 3(3-0)
(Formerly English 2495)

A course designed to provide secondary teachers of English with experiences in linguistics applied to modern grammar and composition.

770. Seminar. Credit 3(3-0)
(Formerly English 2499)

Prerequisite: 15 hours of graduate-level courses in English.

Provides an opportunity for presentation and discussion of thesis, as well as selected library or original research projects from non-thesis candidates.

COURSES IN HUMANITIES**Undergraduate*****200-201. Survey of the Humanities, I, II.**

Credit 3(3-0)

A study of the interrelationship of literature, music and the fine arts; a study of master works, philosophical ideas, and artistic movements of Western Civilization. Classicism and Romanticism will be considered in 200. Modern modes of artistic expression will be considered in 201. Prerequisite: English 101, History 100, 101.

***420. Humanities III, Great Ideas of Western Civilization**

Credit 3(3-0)

A seminar devoted to the identification, analysis, and appreciation of the basic ideas or conceptions which have underlain Western culture in the arts, religion, philosophy and social attitudes from the age of the Greeks to the present. Prerequisite: Humanities 200-201. (Formerly 2454)

DEPARTMENT OF FOREIGN LANGUAGESWAVERLYN N. RICE, *Chairman*

The program of the Department of Foreign Languages is based on the principle that ability to converse and understand people of other nations as well as a knowledge of one's own language, is basic to a democratic society. In view of this, the objectives are:

1. To develop reasonable facility in the reading, listening, speaking, and writing of modern foreign languages.
2. To develop a better knowledge of modern foreign cultures.
3. To create a spirit of understanding that will result in proper attitudes toward different national groups.
4. To prepare students as teachers of foreign languages for employment in secondary schools.
5. To encourage students who manifest linguistic ability to continue further study and research.

The Department of Foreign Languages offers courses in French, Spanish, Russian, and German. A major is given in French (Teaching and Professional).

Teaching major—The curriculum in this area requires that a student, first of all, complete all courses and regulations as outlined by the Department of Education for certification at the secondary school level. In addition, a student is required to complete a minimum of 36 semester hours of French beyond the elementary level. Courses to be taken are as follows:

REQUIRED COURSES FOR FRENCH MAJORS

<i>Course No.</i>	<i>Credit Hours</i>	<i>Course Name</i>
French 300	3	Intermediate French I
French 301	3	Intermediate French II
French 400	3	French Phonetics
French 410	3	Intermediate Oral French
French 411	3	Advanced Oral French
French 415	3	Survey of French Literature I
French 416	3	Survey of French Literature II
French 508	3	French Civilization

* Course may be taken to satisfy General Education requirements

French majors are to select a minimum of six (12) hours from the following courses to complete requirements.

French 505	3	Advanced French Composition
French 506	3	Advanced French Grammar and Composition
French 607	3	French Literature of the Seventeenth Century
French 608	3	French Literature of the Eighteenth Century
French 609	3	French Literature of the Nineteenth Century
French 610	3	The French Theatre
French 612	3	Nu French Novel
French 614	3	French Syntax
French 616	3	Contemporary French Literature

Professional major—This curriculum requires the student to complete the same number of hours as for the teaching program. In addition he is to take as many hours as possible in the other foreign languages offered by the Department. This curriculum is especially recommended for students who wish to follow a career as translators and interpreters as well as advanced ROTC students in Army or Air Intelligence.

A minor may be achieved in French and Spanish by students who complete a minimum of 21 semester hours in Spanish and 24 hours in French.

Students who have completed one unit of high school language or who have no knowledge of a language are to enroll in an elementary language course. For those students presenting two units or more of high school credits, French 300, and French 301, or Spanish 320 and Spanish 321 are required.

COURSES IN FRENCH

Undergraduate

- *100. Elementary French I.** Credit 3(3-0)
(Formerly French 101, 102, 2500)

A course for beginners which emphasizes the four language skills—reading, writing, speaking, listening. Prerequisite: none.

- *101. Elementary French II.** Credit 3(3-0)
(Formerly French 102, 103, 2501)

A continuation of French 2500 with further emphasis placed on the oral-aural approach. Prerequisite: French 2500, or equivalent.

- *300. Intermediate French I.** Credit 3(3-0)
(Formerly French 201, 2520)

A course which consists of a brief review of pronunciation. Grammar is stressed with emphasis on easy cultural reading. Prerequisite: French 2500 or 2501, or two units of high school French.

- *301. Intermediate French II.** Credit 3(3-0)
(Formerly French 202, 2521)

This course is a continuation of French 2520. Stress is placed on grammar, cultural reading and conversation. Prerequisite: French 2520, or equivalent.

* Course may be taken to satisfy General Education requirements

- 400. Phonetics.** Credit 3(3-0)
(Formerly French 203, 2522)

A course in French sounds and diction. Required of all students majoring and minor-
ing in French. Recommended for those who wish to improve pronunciation. Prerequi-
site: French 2500 and 2501.

- 410. Intermediate Oral French.** Credit 3(3-0)
(Formerly French 204, 2523)

Intermediate oral French Course which prepares students for French 2524. It is
designed to enable students to understand lectures and conversations of average tempo.
Prerequisite: French 2520 and 2521.

- 411. Advanced Oral French.** Credit 3(3-0)
(Formerly French 205, 2524)

A course which offers to students intensive training in self-expression and an oppor-
tunity to improve pronunciation, diction, reading and speaking.

- 415. Survey of French Literature I.** Credit 3(3-0)
(Formerly French 301, 2540)

A general introduction to the study of French literature. This course gives a clear idea
of the great periods and main tendencies in history of French thought and letters from
842 to the 19th century.

- 416. Survey of French Literature II.** Credit 3(3-0)
(Formerly French 301, 2541)

A continuation of French literature from the 19th century to the present.

- 505. Advanced French Composition.**
(Formerly French 401, 2560)

Advanced course in oral and written self expression in French. Special attention to
vocabulary building, free composition and conversation, prepared and improvised, cover-
ing the many phases of everyday activities.

- 506. Advanced French Grammar and Composition.** Credit 3(3-0)
(Formerly French 402, 2561)

Course designed to give the students practical training in the use of advanced French
grammar and reading. Conducted largely in French.

- 508. French Civilization.** Credit 3(3-0)
(Formerly French 404, 2562)

A general survey of the history of France, with emphasis on the social, political and
economic development designed to give the students an understanding of present
conditions and events. A detailed study of such French institutions as art, music, and
education. Course is also offered in conjunction with reports of collateral readings.

Advanced Undergraduate and Graduate

- 602. Problems and Trends in Foreign Languages.** Credit 3(3-0)
(Formerly French 501, 2571)

Problems encountered by teachers given consideration. Place and purpose of foreign
language in the curriculum today.

- 603. Oral Course for Teachers of Foreign Languages.** Credit 3(3-0)
(Formerly French 502)

Designed for teachers of foreign languages to improve pronunciation and spelling.

- 606. Research in the Teaching of Foreign Languages.** Credit 3(3-0)
(Formerly French 503, 2573)

Open to students who are interested in undertaking the study of a special problem in the teaching of a foreign language.

- 607. French Literature of the Seventeenth Century.** Credit 3(3-0)
(Formerly French 302, 2574)

Course presents Classicism through masterpieces of Corneille, Racine, Moliere and other authors of the "Golden Period" in French letters.

- 608. French Literature of the Eighteenth Century.** Credit 3(3-0)
(Formerly French 303, 2575)

To study in particular the life and works of Montesquieu, Voltaire, Rousseau, and the Encyclopedists.

- 609. French Literature of the Nineteenth Century.** Credit 3(3-0)
(Formerly French 304, 2576)

Study of the great literary currents of the Nineteenth century Romanticism and Realism.

- 610. The French Theatre.** Credit 3(3-0)
(Formerly French 504, 2577)

A thorough study of the French theatre from the Middle Ages to the present.

- 612. The French Novel.** Credit 3(3-0)
(Formerly French 505, 2578)

A study of the novel from the Seventeenth Century to the present.

- 614. French Syntax.** Credit 3(3-0)
(Formerly French 506, 2579)

Designed to teach grammar on the more advanced level.

- 616. Contemporary French Literature.** Credit 3(3-0)
(Formerly French 305 and 2542, 2580)

Course deals with the chief writers and literary currents from 1900 to the present.

FOR GRADUATE STUDENTS ONLY

For descriptions of these courses, see the bulletin of the Graduate School.

- 720. Advanced Reading and Composition.** Credit 3(3-0)
(Formerly 601 and 2580, 2585)

- 722. Romantic Movement in France (1820-1848).** Credit 3(3-0)
(Formerly 602 and 2581, 2586)

- 724. Seminar in Foreign Languages.** Credit 1(1-0)
(Formerly 603 and 2582, 2587)

- 726. Contemporary Literary Criticism.** Credit 3(3-0)
(Formerly 604 and 2583, 2588)

- 728. Independent Study in Foreign Languages.** Credit 3(3-0)
(Formerly 2584, 2589)

COURSES IN SPANISH

Undergraduate

- *104. Elementary Spanish I.** Credit 3(3-0)
(Formerly Spanish 101, 102, 2504)
A course for beginners which consists of grammar, composition, translation, practice in pronunciation and use of the spoken language.
- *105. Elementary Spanish II.** Credit 3(3-0)
(Formerly Spanish 102, 103, 1205)
Continuation of Elementary Spanish 2504. Attention is given to advanced grammar. Prerequisite: Spanish 2504 or equivalent.
- *320. Intermediate Spanish I.** Credit 3(3-0)
(Formerly Spanish 201, 2530)
Review of grammar, composition and conversation. Prerequisite: Spanish 2505 or two years of high school Spanish.
- *321. Intermediate Spanish II.** Credit 3(3-0)
(Formerly Spanish 202, 2531)
Continuation of Spanish 2530. Prerequisite: Spanish 2530 or equivalent.
- 440. Phonetics.** Credit 3(3-0)
(Formerly Spanish 202, 2532)
A systematic analysis of speech sounds, and the operation of phonetic laws. Prerequisite: Spanish 2505 or equivalent.
- 441. Intermediate Conversation.** Credit 3(3-0)
(Formerly Spanish 204, 2533)
Practice and drill in oral Spanish based principally on topics of current interest. Prerequisite: Spanish 2505 or equivalent.
- 422. Introduction to Spanish Literature.** Credit 3(3-0)
(Formerly Spanish 250, 2534)
Readings of representative authors of Spain. Prerequisite: Spanish 2505 or equivalent.
- 450. La Cultura Hispanica.** Credit 3(3-0)
(Formerly Spanish 301, 2543)
A course which covers the basically significant elements of Hispanic Civilization: geography, history, literature, and economics of the Spanish people. Prerequisite: Spanish 2505 or equivalent.
- 451. Survey of Spanish Literature I.** Credit 3(3-0)
(Formerly Spanish 302, 2544)
A survey of Spanish literature from the Cid through the golden age with assigned readings and reports. Prerequisite: Spanish 2505 or equivalent.
- 452. Survey of Spanish Literature II.** Credit 3(3-0)
(Formerly Spanish 303, 2545)
A survey of Spanish literature from the seventeenth century to the present. Prerequisite: Spanish 2505 or equivalent.

* Course may be taken to satisfy General Education requirements

455. Syntax.

Credit 3(3-0)

(Formerly Spanish 304, 2546)

Systematic study of Spanish grammar with conversational and other exercises based on contemporary authors. Prerequisite: Spanish 2531.

COURSES IN GERMAN**Undergraduate*****102. Elementary German I.**

Credit 3(3-0)

(Formerly German 101, 102, 2502)

Fundamentals of pronunciation and grammar. Attention given to prepared and sight translations and vocabulary building.

***103. Elementary German II.**

Credit 3(3-0)

(Formerly German 102, 103, 2503)

Continuation of emphasis on grammar, vocabulary building, prepared and sight translations. Maximum attention given to graded readings in German prose and drama.

420. Conversational German.

Credit 3(3-0)

(Formerly German 201, 2526)

Intensive practice in everyday German is provided. Prerequisites are German 2502, 2503, or approval of instructor.

422. Intermediate German I.

Credit 3(3-0)

(Formerly German 202, 2527)

This course is open to students who have completed German 2502 and 2503. The students read a cross-section of the simpler writings in German literature and German newspapers.

423. Intermediate German II.

Credit 3(3-0)

(Formerly German 203, 2528)

The students continue simple readings from German literature and read also a significant, simplified novel.

425. Intermediate Scientific German.

Credit 3(3-0)

(Formerly German 205, 206, 2529)

Works in science on the second-year level.

427. Survey of German Literature.

Credit 3(3-0)

(Formerly German 2530)

A general introduction to the study of German literature. This course is intended to give an over-all picture of German literature and an opportunity to read outstanding works not offered in other German courses.

COURSES IN RUSSIAN***106. Elementary Russian I.**

(Formerly Russian 2506)

An elementary course for beginners which consists of grammar, translation, practice in pronunciation and limited use of the spoken language.

Prerequisite: None.

* Course may be taken to satisfy General Education requirements

***107. Elementary Russian II.**
(Formerly Russian 2507)

Continuation of Elementary Russian 2506. Attention is given to more advanced grammar. Reading in Russian is stressed.

Prerequisite: Russian 2506.

DEPARTMENT OF MUSIC

J. J. WILLIAMS, *Acting Chairman*

The general objectives of the department of music are: (1) to enhance the cultural and aesthetic life of the university student through personal experiences in a well directed program of education in music; (2) to provide the student with basic skills, techniques, pedagogical concepts, and perspective for a career as an artist and as a teacher of music on the elementary and secondary school levels; and (3) to interpret, create, and maintain the highest level in individual and group performance in music. The department of music currently offers two degree programs. One of these is a curriculum leading to the Bachelor of Science Degree with a major in music. This degree program is designed to accommodate students who wish to enter some area of music other than teaching. The other is a teacher-education curriculum leading to the Bachelor of Science degree in music education. Students intending to teach in the public schools are strongly urged to follow this curriculum in order that they may meet certification requirements.

Upon entrance into the music education program, each student must choose either an instrumental or a choral concentration. Those whose principal applied music subject is either voice or piano must select choral concentration; and those whose principal applied music subject is stringed, wind, or percussion instrument must select the instrumental concentration.

Each student with a major or minor in music is required to maintain continuous membership in the principal ensemble related to his area of concentration. Students with a choral concentration must perform in the choir; and students with an instrumental concentration must perform in the band.

With the exception of the piano, every student majoring or minoring in music is required to furnish an instrument for his personal use. University owned instruments are primarily for the use of non-majors who serve in the instrumental ensembles and to complete the necessary instrumentation of those ensembles as need dictates. In as great a quantity as is possible, university owned instruments will be provided for the instruction of music majors and minors in music education classes.

At least one solo performance on a regularly scheduled student recital is required of all music majors during each semester in which the student is enrolled in applied music. These required performances must be performed from memory. Additional solo or chamber performances may or may not be memorized with the decision for such resting solely with the teacher involved. All students should expect that the study of applied music will include the regular use chamber music as well as solo literature. The department expects that all literature used for recital performance will be representative of the finest for the performing medium and that contemporary as well as older compositions will be included.

Concurrent with the last required semester of applied music study and prior to the final examination period during that semester, each music major must present a full

* Course may be taken to satisfy General Education requirements

public recital. The program of such a performance should usually be made up of the works studied during the several preceeding semesters of residence.

Appearances for performance on recitals must be carried through on the date assigned by the instructor. Postponement of a scheduled appearance is allowable only in emergencies and with the concurrence of both the instructor and the department chairman. Any postponed performance must be given on a regularly scheduled student recital. Failure to appear will result in a failing grade for the recital and may seriously affect the grade for the course.

Attendance is required for all music majors and minors at student or faculty recitals, band, choir, and chamber ensemble concerts, and lyceum programs that involve musical performance. A systematic method of checking and recording attendance will be used.

An examination by a faculty committee is required of every student upon completion of each semester of applied music. At these examinations, the student must display such competencies, skills, techniques, facility, musicianship, and repertoire as is required by the instructor for his level. These requirements will have been made known to the student and submitted *in writing* to the department office at the beginning of the semester. A minimum level for an acceptable performance which has been previously established by the instructor must be attained to gain a passing grade on the examination. Committee examinations in applied music will be given either immediately before or during the regular semester's examination period. Attendance at these examinations will be subject to the same regulations as all other university finals. A failing grade will seriously jeopardize successful completion of the course.

Admission to the teacher-education program of the university is regulated by the School of Education. The student is evaluated at the end of the sophomore year. The regulations as set forth will be observed strictly; no student will be admitted without having met all requirements. A failure to gain admission to the program will prevent the student from taking professional education courses until he satisfies all conditions, and will thereby cause a possible delay in graduation.

All students will be assigned to a faculty advisor for counseling in matters of curriculum, academic, and personal problems as are appropriate. Each individual should consult regularly with his advisor and take advantage of that persons experience.

BACHELOR OF SCIENCE IN MUSIC EDUCATION

Choral Concentration

- I. Applied Music—21 Semester Hours:
100, (Diction)* 113, 213, 413, 513 (Principal Subject)
114, 214 (Secondary Subject); 614 Choral Conducting
- II. Music Theory—21 Semester Hours:
101, 102, 200, 201, 400, 401, 402, 501
- III. Music History and Literature—9 Semester Hours:
403, 404, and 405 or 406
- IV. Music Education—12 Semester Hours
424, 425, 426, Education 530, 531
- V. Music Performance—16 Semester Hours:
301 (Eight Semesters); 307 Student Recital (Eight Semesters)

Total Hours Required: 79 Semester Hours

* Instead of Music Diction, piano students should take 560—Accompanying during the Junior Year.

BACHELOR OF SCIENCE IN MUSIC EDUCATION**Instrumental Concentration**

- I. Applied Music—21 Semester Hours:
113, 213, 413, 513 (Principal Subject)
114, 214 (Secondary Subject) 503
- II. Music Theory—21 Semester Hours:
101, 102, 200, 201, 400, 401, 402, 501
- III. Music History and Literature—9 Semester Hours:
403, 404, and 405 or 406
- IV. Music Education—13 Semester Hours:
424, 425, 426, 431, and Education 530, 532
- V. Performance Organizations—16 Semester Hours:
300 (Eight Semesters), 307 (Eight Semesters)

Total Number of Required Hours: 79 Semester Hours

BACHELOR OF SCIENCE IN MUSIC**Applied Music Concentration**

- I. Applied Music—31 Semester Hours:
113, 213, 413, 513, Principal Subject; and 114, 214 minor subject; 503
Score Reading and Conducting; 100 (Voice Students Only)
- II. Music Theory—23 Semester Hours:
101, 102, 119, 200, 201, 400, 401, 402, 501
- III. Music History and Literature—10 Semester Hours:
403, 404; 408, 412 (Wind and Percussion Students Only)
409, 412 (Piano Students Only)
- IV. Music Performance—20 Semester Hours:
307 (Student Recital—Eight Semesters)
Wind and Percussion:
300 (Eight Semester); and either 302, 303 or 304 (Four Semesters).
Voice and Piano:
301 (Six Semester); and either 305, 306 or 560 (Four Semesters)
- V. Other—3 Semester Hours:
618 Psychology of Music

Total Required Hours—84 Semester Hours

BACHELOR OF SCIENCE IN MUSIC**History and Literature Concentration**

- I. Applied Music—23 Semester Hours:
113, 213, 413, 513 Principal Subject; 114, 214 Secondary Subject; 100
(Voice Students Only); 503, Score Reading and Conducting; 450 (Accompanying-Piano Students Only).

- II. Music Theory—23 Semester Hours:
101, 102, 119, 200, 201, 400, 401, 402, 501
- III. Music History and Literature—18 Semester Hours:
403, 404, 405, 406, 407, 408, 410 and either 409, 411 or 412
- IV. Music Performance—16 Semester Hours:
300 Eight Semesters—(Wind and Percussion Students) or
301—Eight Semesters (Voice and Piano Students)
307 (Student Recital—Eight Semesters)
- V. Other—Eight Semesters Hours:
618—Psychology of Music; English 210 and English 500

Total Hours Required—88 Semester Hours

COURSES IN MUSIC THEORY

101, 102 Theory I, II Credit 3(2-2) Each Semester

Review of the fundamentals of music, including the rudiments of music theory; construction and function of scales; intervals, triads and dominant seventh chords in root position and inversions; use of non harmonic tones; correlated analysis, rhythmic, melodic, harmonic, and key board drill.

119 Sight Singing and Ear Training Credit 1(0-2)

Fundamentals of musicianship; corrected rhythmic, melodic, and harmonic drills.

201, 202 Theory III, IV Credit 3(2-2) Each Semester

Modulation, construction and function of seventh, ninth, eleventh, and thirteenth chords in root position and inversions; chromatic harmony, advanced modulation; trends of the twentieth century; correlated analysis, sight-singing, ear training, dictation, and keyboard drill. Prerequisites: 101, 102.

400, 401 Counterpoint I, II Credit 2(2-0) Each Semester

Strict counterpoint in two or more parts; imitation; two and three-part inventions; canon; forms based on the chorale; invertible counterpoint; the fugue, Prerequisites: 200, 201.

402 Form Analysis Credit 2(1-2)

Harmonic and melodic structure of the phrase; phrases in combination; the analytical method; theme and variation, ternary, rondo, binary, sonata, concerto and unique forms; the fugue and related genres. Prerequisites: 202, 400.

501 Arranging Credit 3(2-2)

Seating for chorus, band, orchestra, vocal and instrumental chamber ensembles. Prerequisites: 400, 401.

COURSES IN MUSIC HISTORY AND LITERATURE

216 Music Appreciation I Credit 3(3-0) Each Semester

A study of melody, harmony, rhythm, simple forms, vocal music, texture and

the orchestra. Designed for the general student to provide an introductory survey to the art of music.

217 Music Appreciation II

A survey of the literature and styles of the several periods of music history from antiquity through the present. Designed for the general student as a continuation of Music Appreciation I. Prerequisite: Music 216.

218 Introduction to Music Literature Credit 2(2-0)

Familiarization of student with large body of musical material from all branches of musical writing; for vocal and instrumental, solo and ensemble, symphonic and choral groups. Special attention is given to style and structural procedures by principal composers. Designed for students with some musical background.

403 History and Literature of Music I Credit 3(2-2)

Analysis of main works of music literature presented in historical order; form, harmonic and contrapuntal devices, orchestration, and other stylistic features investigated against the background of historic, artistic and cultural developments; Ancient, Medieval, Renaissance and Baroque periods. Prerequisites: 101, 102

404 History and Literature of Music II Credit 3(2-2)

Analysis of main works of music literature presented in historical order; form, harmonic and contrapuntal devices, orchestration, and other stylistic features investigated against the background of historic, artistic, and cultural developments; Classical, romantic, Postromantic and contemporary periods. Prerequisite: 403.

405 Music of the Baroque Period Credit 2(1-2)

Analysis of the main works of the principal composers of the early, middle, and late Baroque periods culminating with a more detailed study of the works of Handel and J. S. Bach; vocal, keyboard and other instrumental forms included; emphasis on stylistic characteristics. Prerequisite: 403.

406 Music of the Romantic Period Credit 2(1-2)

Intensive study of the works of the principal composers of the Romantic era; emphasis on general and individual stylistic characteristics. Prerequisite: 404

407 Modern Music from 1890 to the Present Credit 2(1-2)

Music of the so-called Viennese school of the twentieth century against the background of late German romanticism and French impressionism; the dissolution of the tonal system and the development of the serial principle; the music of Bartok, Stravinsky and others in the light of nineteenth and twentieth century investigations of folk or national materials and their influence upon serious artists; the relationship of Bartok and Stravinsky to traditional harmonic principles and to the formal structures of the past; other trends in the twentieth century. Prerequisites: 201, 404.

408 The Symphony Credit 2(1-2)

The formulation of classical principles of construction by Josef Haydn, with reference to the contributions of Gluck, C.P.E. Bach and the Mannheim school; the fulfillment of the classical ideal of the works of Mozart and Beethoven; changing

concepts of the symphony after Beethoven; the Romanticists approach to form; study of the major Romantic symphonies by composers from Schubert to Mahler. Prerequisites: 201, 404.

409 Keyboard Music Credit 2(1-2)

Techniques, musicianship, and stylistic aspects of interpretation; from pre-Bach to the present; intellectual, emotional, and imaginative aspects of performance as exemplified by works from leading composers including Bach, Mozart, Beethoven, Chopin, Schumann, Debussy, and Moussorgsky; all lectures illustrated at the piano. Prerequisite: 404.

410 Opera Credit 2(1-2)

Establishment of the opera as a feasible musico-dramatic genre and the various solutions to problems of the opera as suggested by composers from the seventeenth to the twentieth centuries; special emphasis on the works of Monteverdi, Scarlatti, Gluck, Mozart, Wagner, and Verdi. Prerequisites: 201, 404.

411 The Art Song Credit 2(1-2)

Survey of the art song from seventeenth century Italy to present, with special emphasis on the song literatures of Germany, France, and contemporary America; practice in interpretation with particular attention to style and diction. Prerequisite: 404.

412 Chamber Music Credit 2(1-2)

Analysis of masterworks of chamber literature for instrumental and vocal ensembles by the main composers for each of the several periods in music history; interpretation. Prerequisite: 404

COURSES IN MUSIC EDUCATION

424 Percussion Instruments Credit 2(1-2)

Playing of percussion instruments; basic techniques of snare drum, timpani, xylophone, bells, chimes, and other percussion instruments are presented and practiced.

425 Woodwind Instruments Credit 2(1-2)

Playing of woodwind instruments; basic techniques for clarinet, flute, oboe, saxophone and bassoon are presented and practiced.

426 Brasswind Instruments Credit 2(1-2)

Playing of brasswind instruments; basic techniques for trumpet, French horn, trombone, euphonium and tuba are presented and practiced.

427 Voice Class Credit 1(0-2)

Use of the singing voice; basic principles of singing, interpretation and musicianship; physiology, breathing; tone production, resonance and diction; application of basic principles to singing voice; pronunciation, articulation, intonation, attack, legato, sostenuto, flexibility and dynamics; ensemble singing; techniques for producing choral tone in accompanied and unaccompanied styles, choral procedure and repertoire.

PERFORMANCE ORGANIZATIONS

The total number of semester hours to be earned through performance organization courses is specified in the outlines of major curricula. Every music major is required to perform in one of the two major organizations (band or choir). If the principal applied subject is a wind or percussion instrument, the student must elect band; if the principal applied subject is voice or piano, the student must elect choir. The organization elected must be repeated each semester as specified until the required number of semester hours has been earned. Other performance organization are elected as required by the several curricula and similarly repeated for credit until the necessary semester hours have been earned.

300 University Band Credit 2(0-5)

The University Marching Band is organized in the fall of the year (first semester) and plays for all football games. It is open to all qualified students, both men and women. The Symphony Band functions after the football season and continues for the rest of the year. Membership in both the Symphony and Marching Bands through audition with the Director of Bands. May be repeated for credit each semester.

301 University Choir Credit 2(0-4)

An organization designed to perform a wide range of compositions written for mixed voices representing various musical styles and periods.

Numerous appearances throughout the year on campus and for various churches and civic organizations. Tours are planned annually for the southeastern, eastern, and midwestern regions of the country. Membership is open to all qualified students, both men and women through audition with the director. May be repeated for credit each semester.

302 Brass Ensemble Credit 1(0-2)

The study and performance of literature for brass instrument chamber groups from all periods of music history and in all styles. Frequent public concerts. Membership is open to all qualified students, both men and women through audition with the director. May be repeated for credit each semester.

303 Woodwind Ensemble Credit 1(0-2)

The study and performance of literature for woodwind chamber music history and in all styles. Frequent public concerts. Membership is open to all qualified students, both men and women through audition with the director. May be repeated for credit each semester.

304 Percussion Ensemble Credit 1(0-2)

The study and performance of literature for percussion chamber groups representing a wide variety of styles. Designed to develop skill in ensemble performance on all of the instruments of percussion used in this growing modern repertoire, membership is open to all qualified students, both men and women through audition with the director. Frequent public concerts. May be repeated for credit each semester.

305 Opera Workshop Credit 1(0-2)

Musical and dramatic group study and performance of excerpts from the operatic repertoire. Includes an annual production of a standard opera and/or con-

temporary chamber work, with staging, costumes, and scenery. Students must secure the approval of their university voice instructor before enrolling. May be repeated for credit each semester.

306 Male Singers

Credit 1(0-2)

A choral organization designed to perform a wide range of compositions written for men's voices and representing various musical styles and periods. Frequent public concerts. Membership is open to all qualified male students through audition with the director. May be repeated for credit each semester.

307 Student Recital

Credit 0(0-1)

A weekly assembly of music students with members of the faculty, providing opportunity for experience in public performance before an audience, lecture and discussion of problems in the general area of performance including ensemble playing and singing, conducting, accompanying, stage deportment, solo performance. (Required of all music majors during each semester of residence; a grade of pass (P) or fail (F) will be assigned on the basis of participation and attendance).

APPLIED MUSIC

Individual instruction is available in the following branches of applied music as both principal and secondary areas of study:

Piano	Flute	Bassoon	Trombone
Voice	Oboe	French Horn	Baritone Horn
Percussion	Clarinet	Trumpet	Tuba

In the principal area of performance, each student receives a one hour individual lesson each week and must practice for at least two (2) hours each day to earn two semester hours credit. To earn three semester hours credit, the student must practice a minimum of three hours each day in addition to his lesson. In the secondary area of performance, each student receives a one hour lesson each week and is required to practice a minimum of one hour each day to earn one semester hour credit. To earn two semester hours credit, each student must practice a minimum of *two* hours each day in addition to his lesson.

PIANO

Requirements for Admission—The applicants who elect piano as their principal instrument should be able to play all major and minor scales and arpeggi at a moderate tempo. They should play with technical ease and musical understanding, compositions equivalent in difficulty to the following: Clementi, *Sonatina*, Op. 36, No. 6; Mozart, *Fantasie in D Minor*; Bach, *Little Preludes*, or Burgmuller, *Studies*, Op. 100.

- 113 A three-part invention by Bach. A movement of a Sonata by Haydn, Mozart, or Beethoven. Work of moderate difficulty by a Romantic composer. Scales and arpeggios in parallel or contrary motion at a moderately rapid tempo. Sight Reading.
- 213 A prelude and fugue from the Well Tempered Calavier by Bach. Completion of the Sonata started in 113. A work from the Romantic school. A work written since 1900. Scales and arpeggios at rapid tempo. Sight reading.

413 Dance forms from French suites or parties by Bach. A sonata by Haydn, Mozart or Beethoven one movement memorized. A work from the Romantic School. A contemporary work. Sight reading.

513 A prelude and fugue from the Well-Tempered Clavier by Bach, a sonata by Haydn, Mozart, or Beethoven, one movement memorized. A work from the Romantic school. A contemporary work. Sight reading.

560 Accompanying Credit 2(0-4)

Analysis and practice in piano accompaniment of singers and instrumentalists; sight reading and transposition; discussion of style and performance; experience in public performance. May be repeated for credit each semester. Prerequisite. Consent of instructor.

VOICE

Requirements for Admission—The applicant should give evidence of ability to sing simple standard or classic art songs with adequate tone quality and intonation. Some knowledge of piano is highly desirable.

100 Diction for Singers Credit 1(0-2)

A course designed to familiarize students with the pronunciation of English, Italian, German, and French through the study and use of the International Phonetic Alphabet.

113 1) Competencies: Correct posture, breathing habits, phrasing, various five-note scales, diction.
2) Studies: Simple English and Italian art songs, folk songs, spirituals.
3) Solos: Six songs in English and Italian to be memorized each semester. Representative composers: Scarlatti, Handel, Purcell

213 1) Competencies: Correct posture, breathing habits, phrasing, diction, scales and arpeggios.
2) Studies: English and Italian art songs, German art songs, folk songs, spirituals.
3) Solos: Eight songs in English, Italian, and German to be memorized each semester. Representative composers: Durante, Scarlatti, Schumann.

413 1) Competencies: Continuation of 213
2) Studies: English and Italian art songs, German songs, French art songs, folk songs and spirituals.
3) Solos: Nine songs in English, Italian, German, and French to be memorized each semester. Representative composers: Schumann, Schubert, Strauss, Faure, Britten, Mozart.

513 1) Competencies: Continuation of 413 with emphasis on preparation for senior recital.
2) Studies: Continuation of 413 with more intricate scales and arpeggios.
3) Solos: 10 songs in English, German, Italian and French to be memorized. Representative composers: Wolf, Schumann, Faure, Verdi, Britten, Handel, Debussy.

427 Voice Class Credit 1(0-2)

Use of the singing voice; basic principles of singing; interpretation and musicianship; psychology, breathing; tone production, resonance and diction; application of basic principles to singing voice; pronunciation, articulation, intonation, attack, legato, sostenuto, flexibility and dynamics; ensemble singing; technique for producing choral tone in accompanied and unaccompanied styles; choral procedure and repertoire.

PERCUSSION

Requirements for Admission: The candidate shall demonstrate satisfactory performing ability in at least one of the following areas of percussion.

Performance: Snare drum, xylophone, marimba and timpani. These competencies will include:

1. The ability to perform a solo.
2. The ability to perform an excerpt from a book in which the applicant has studied that will demonstrate musicianship and technical skill.
3. The ability to play at sight representative literature which is characteristic of the instrument.
4. Previous ensemble experience in band and/or orchestra.

Additional competencies for snare drum:

1. Basic knowledge of rudiments.
2. The performance of a Sawa march or the equivalent.

Additional competencies for xylophone marimba:

The ability to play major scales through 4 flats and 4 sharps in one octave.

Additional competencies for timpani:

1. Basic knowledge of timpani techniques.
2. A thorough knowledge of range of each timpano.

113, 213 Competencies: (a) Snare Drum; Fundamentals, military techniques, reading and control.

Mallets: Fundamentals, reading technique—musical orientation.

Studies: Price, Beginning Snare Drum; Goldenberg, Mallet Instruments; Stone, Stack Control; Bower, Drum Method; Gardner, Modern Method, Book I, Stone, Mallet Control.

Solos: Wilcaxon, Rudimental Solos; Price, Exhibition Drum Solo; Colgrass, Advanced Snare Drum Solo; Brever Easy—Medium Mallet Solos; Stone, Military Drum Beats.

413, 513 Competencies: (a) Snare Drum; Fine control, orchestra techniques. (b) Mallets: Reading, advanced techniques, 3 and 4 hammer work: (c) Percussion, "Trap" techniques, tambourine, castanets, brass drum, and cymbals. (d) Timpani: Kettle technique, tuning exercises and control. (e) Latin-American Instruments: Basic skills on each.

Studies: Price, Techniques and Exercises for Triangle, Tambourine and Castanets; Brewer, Daily Studies; Goldenberg, Mallet Instruments. Goodman, Timpani Method; Freisa, Timpani Method; Tourte, Snare Drum Technique; Gardner, Modern Method, Book II, Mallets; Chopin, Advanced Techniques for the Modern Drummer.

Solos: McKenzie, Graded Timpani Solos; Britton, Timpani Solo; Hart, Timpani Solos; Price, Unaccompanied Timpani Solos; Brewer, 3 and 4 Mallet Solos, Quick 3 and 4 Mallet Solos; Stone Rudimental Drum Solos; Duets and Quintets.

WIND INSTRUMENTS

Requirements for Admission: The candidate shall show evidence:

1. Basic development in embouchure and articulation.
2. Knowledge of fingering and alternates.
3. Satisfactory tone quality and control.

4. Ability to play major scales through 4 flats and 4 sharps, in eight notes (M.M. d-72) and the chromatic scale both slurred and articulated.
5. Minimum—Two octave range.
6. Ability to play a simple song demonstrating musicianship which includes phrasing and expression.
7. Previous study in the equivalent of the Rubank Advanced Method.
8. Previous ensemble experience in hand and/or orchestra.
9. Ability to play at sight representative literature which is characteristic of the instrument.

TRUMPET

- 113, 213** *Competencies:* Breathing; elementary embouchure and tone production; tonguing as applied to various instruments; coordination of tone production habits through progressive major and minor scales; practical problems of artistic performance.

Studies: *Cornet and Trumpet*—Complete teaching for cornet—Beeler, Walter Boosey and Hawkins; 1952. *Second Book of Practical Studies for Cornet and Trumpet*—Robert Getchell; Hovey, Nilo. Belwin, Inc. 1948.

Literature: Selected from NIMAC list—Music Education National Conference.

- 413, 513** *Competencies:* Intonation; embouchure techniques; breath control and tone quality; articulation; reading; style; performance techniques.

Studies: *Rubank Advance Method*:

Literature: Selected from NIMAC—Music Educator's National Conference.

FRENCH HORN

- 113, 213** *Competencies:* Breathing; embouchure and tone production; tonguing; progressive major and minor scale technique; practical problems of artistic performance.

Studies: *Rubank, Intermediate Method for French Horn; Modern Pares Foundation Studies*, Whistler; *Daily Exercises for French Horn*, Pottag.

Literature: Selected from NIMAC list—Music Educator's National Conference.

- 413, 513** *Competencies:* Intonation, embouchure techniques, breath control and tone quality; articulations; reading; style; performance techniques.

Studies: *Rubank, Advanced Method for French Horn*.

Literature: Selected from NIMAC list—Music Educator's National Conference

TROMBONE—BARITONE

- 113, 213** *Competencies:* Breathing, elementary embouchure and tone production; tonguing as applied to various instruments; coordination of tone production habits through progressive major and minor scales; practical problems of artistic performances.

Studies: *Trombone and Baritone*

Arbans-Prescott Method for Trombone-Baritone—Carl Fisher, Inc. *Rubank—Intermediate Method for Trombone-Baritone*. Skornicka and Boltz, Rubank, Rubank, Inc. *Modern Pares Foundation Studies for Trombone & Baritone*—Whistler.

Literature: Selected from NIMAC list—Music Educator's National Conference.

Competencies: Intonation, embouchure techniques; breath control and tone quality; articulations; reading; style; performance techniques.

Studies: Rubank, *Advanced Method for Trombone and Baritone*.

Literature: Selected from NIMAC list—Music Educators National Conference.

TUBA

- 113, 213** *Competencies:* Breathing; elementary embouchure and tone production; tonguing as applied to various instruments; coordination of tone production habits through progressive major and minor scales; practical problems of artistic performances.

Studies: Tuba

Rubank Intermediate Method for Brass—Skornicka and Boltz. Rubank, Inc. First Book of Practical Studies for Tuba—Hovey N. Belwin, Inc. Vandercook Etudes for Bass—Rubank, Inc.

Literature: Selected from NIMAC list Music Education National Educator's Conference.

- 413, 513** *Competencies:* Intonation, embouchure techniques; breath control and tone quality; articulation; reading; style; performance techniques.

Studies: Rubank, *Advanced Method for Tuba*

Literature: Selected from NIMAC list—Music Educators' National Conference.

FLUTE

Music 113 Level I:

Competencies: Major and Minor Scales through 5 sharps and 5 flats. Emphasis on fingering and tonal development.

Studies: Soussmann, *Complete Method for Flute*; Andersen, *24 Progressive Studies, Op. 33*

Literature: Bizet, *Minuet*; Mozart, *Adagio*

Music 213 Level II

Competencies: All Major and Minor Scales throughout the practical performing range. Emphasis on sight reading.

Studies: Caually, *Melodious and Progressive Studies for Flute* Soussmann

Literature: Bach, *Suite in B. Minor*; Handel, *Sonatas*

Music 413 Level III

Competencies: Continued scale study, emphasis on performing literature

Studies: Soussmann—Moyse, *Flute Studies*

Literature: Bach, *Sonatas*; Debussy, *Syrinx*

Music 513 Level IV

Competencies: Continued emphasis on performing literature

Studies: Schmitd, *Orchestral Studies*

Literature: Chaminade, *Concertino* Hindemith, *Sonata*

OBOE

Music 113 Level I

Competencies: Major and Minor scales through 5 sharps and 5 flats. Emphasis on fingering and tonal development.

Studies: Ferling, *144 Preludes and Studies*; Barret, *Complete Method For Oboe*
Literature: Franck, *Piece V*; *Piece in G. Minor*

Music 213 Level II

Competencies: All Major and Minor scales throughout the practical performing range. Emphasis on sight reading. Reed adjustment

Studies: Barret, *Method*; Tustin, *Technical Studies*

Literature: Schumann, *Three Romances*; Telemann; *Concerto in F. Minor*

Music 413 Level III

Competencies: Continued scale study, emphasis on performing literature. Reed making.

Studies: Tustin, *Studies*; Prestin, *Studies*

Literature: Handel, *Sonata in G. Minor*. Goosens, *Concerto*

Music 513 Level IV

Competencies: Continued emphasis on performing literature.

Studies: *Orchestral Literature*

CLARINET

Music 113 Level I

Competencies: Major and Minor Scales through 5 sharps and 5 flats. Emphasis on fingerings and tonal development.

Studies: Klose Celebrated Method for Clarinet and Rose 32 Etudes.

Literature: Stubbins, *Recital Literature for the Clarinet*, Vol. II

Music 213 Level II

Competencies: All Major and Minor Scales throughout the practical performing range. Emphasis on sight reading. Reed adjustment.

Studies: Klose, Rose 40 Etudes

Literature: Stubbins, *Recital Literature*, Vols. I and II

Music 413 Level III

Competencies: Continued scale study, emphasis on performing literature.

Studies: Baermann, *Method for Clarinet*; Jean Jean, 18 Etudes de Perfectionnement.

Literature: Stubbins, *Recital Literature*, Vol III (The Concertos)

Music 513 Level IV

Competencies: Continued emphasis on performing literature.

Studies: Baermann; Jean Jean; *Orchestral Studies*

Literature: Bernstein, *Sonata*; Debussy, *Rapsodie*

SAXOPHONE

Music 113 Level I

Competencies: Major and Minor Scales through 5 sharps and 5 flats. Emphasis on fingerings and tonal development.

Studies: DeVille, *Universal Method*; Endrejen, *Supplementary Studies*

Literature: Benson, *Cantilena*; Gretchaninof, *Phantasme*

Music 213 Level II

Competencies: All Major and Minor Scales throughout the practical performing range. Emphasis on sight reading. Reed adjustment.

Studies: DeVille; Belemant, *20 Melodic Studies*; Rascher, *Top Tones for Saxophone*

Literature: Bozza, *Aria*; Casadesus, *Romance*

Music 413 Level III

Competencies: Continued scale study, emphasis on performing literature. Introduction to jazz improvising.

Studies: DeVille; Rascher, *158 Saxophone Exercises*

Literature: Creston, *Sonata*; Debussy, *Rapsodie*; Fasch, *Sonata*; Music Minus one Saxophone.

Music 513 Level IV

Competencies: Continued emphasis on performing literature.

Studies: Traxler-Lazarus, *Virtuoso Studies*

Literature: Bozza, *Scaramouche*

BASSOON

Music 113 Level I

Competencies: Major and Minor Scales through 5 sharps and 5 flats. Emphasis on fingerings and tonal development.

Studies: McDowell, *Practical Studies, Bk. I*; Kovar, *24 Daily Exercises*; Wessenborn, *Practical Method Bassoon*.

Literature: Bakalenikoff, *Three Pieces*; Weinberger, *Sonatine*

Music 213 Level II

Competencies: All Major and Minor Scales, throughout the practical playing range. Emphasis on sight reading. Reed adjustment and Making.

Studies: Wessenborn, *Method for Bassoon*; Kovar, *24 Daily Exercises*; McDowell, *Practical Studies, Bk. II*

Rep. Literature: Telemann, *Sonata in F Minor*; Weber, *Concerto in F (Slow Movement)*

Music 413 Level III

Competencies: Continued scale study, emphasis on performing literature.

Studies: Wessenborn; Kessler, *Bassoon Passages*

Literature: Pierne, *Concert Piece*; Galliard, *Sonatas*; Mozart, *Concerto*

Music 510 Level IV

Competencies: Continued emphasis on performing literature. Orchestral Studies.

Studies: Orchestral Passages

Literature: Hindemith, *Sonata*

*COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES***609 Music in Early Childhood** Credit 3(2-2)

A conceptual approach to the understanding of musical elements; an understanding of the basic activities in music in early childhood; modern trends in music education; Kodaly and Orff methods.

610 Music in Elementary Schools Today Credit 3(2-2)

Music in the elementary school curriculum; creating a musical environment in the classroom; child voice in singing, selection and presentation of rote songs; development of rhythmic and melodic expressions; directed listening; experimentation with percussion and simple melodic instruments; criteria for utilization of notational elements; analysis of instrumental materials.

614 Choral Conducting of School Music Groups Credit 2(0-4)

Rehearsal techniques; balance; blend and relationship of parts to the total ensemble; analysis and interpretation of literature appropriate for use in school at all levels of ability; conducting experience with laboratory group.

616 Instrumental Conducting of School Music Groups Credit 2(0-4)

Rehearsal techniques; balance, blend and relationship of parts to the total ensemble; analysis and interpretation of literature appropriate for use in school groups at all levels of ability; conducting experience with laboratory group.

618 Psychology of Music Credit 3(3-0)

The use of psychology in the learning and teaching of music.

620 Advanced Music Appreciation Credit 3(2-2)

Analytic studies of larger forms from all branches of music writing; Special emphasis on style and structural procedures by principal composers; works taken from all periods in music history. Designed for students with previous study of music appreciation.

DEPARTMENT OF SPEECH COMMUNICATION AND THEATER ARTS

The general aim of the Department of Speech Communication and Theater Arts is to develop good speech in the individual student and to acquaint him with American Standard Diction and the Standard Speech of his section of the country; to acquaint him with the theater of the world, both technical and literary. This objective is accomplished by means of general voice and diction courses, introductory courses in theater production and dramatic literature, and laboratory courses in which instruction in speech correction and theater is given.

A second general aim of the department is to provide the necessary instruction and training for prospective teachers of speech and theater.

In carrying out these general aims, certain specific objectives are brought into focus. The specific objectives are (1) to train the student to use good speech himself and to recognize it in others; (2) to train him to correct the speech of others; (3) to train him to be able to plan and implement a speech and theater program in a secondary school or in a community; and (4) to provide the background necessary for successful graduate study in speech communication and theater.

The basic course in Speech Fundamentals is offered to the entire University, and nearly all degree programs require students to take at least one course in speech, usually Speech Fundamentals. Thus the Department of Speech Communication and Theater Arts seek to fulfill a major institutional objective.

In addition to the basic speech course required of virtually all degree candidates, the Department proposes to offer a major which has two areas of concentration: Speech and Theater Education, and Professional Theater.

At the beginning of each academic year, speech communication and theater majors are required to register with the department. Students intending to major in speech are encouraged to register at the earliest possible time.

MAJOR CONCENTRATIONS

The student will select one of the concentrations of study in the Department of Speech Communication and Theater Arts (see the concentration descriptions for requirements).

Bachelor of Science 124 Hours 30 hours—Major

SPEECH AND THEATER EDUCATION

Students who wish to prepare for teaching careers in the secondary schools should apply for admission to the Teacher Education Program. Programs for these students are prepared in the consultation with the departmental advisor in Speech Education.

Bachelor of Arts 120 Hours 50 Hours—Major

PROFESSIONAL THEATER

Students who wish to prepare for careers in the Professional Theater must audition before the theater arts faculty and be approved before enrolling in the professional curriculum. Only those students whose backgrounds and abilities give evidence of probable success in their field are encouraged to enter this curriculum. The Department reserves the right to recommend to students a change from the professional program to the teaching program.

Any Speech Communication and Theater Arts Major making a grade of "D" in any major course must repeat the course and pass same with a grade of "C" before that course may be counted toward the Major.

NOTE: A passing grade on the Speech Proficiency examinations is a prerequisite for the degree. Students are advised to take this examination the first semester of their junior year. Failure to pass this examination will result in the student's having to take additional instruction in Speech until he is able to successfully pass the examinations.

REQUIRED COURSES FOR SPEECH AND THEATER MAJORS

<i>Course No.</i>	<i>Credit Hours</i>	<i>Course Name</i>
Speech 250	2	Speech Fundamentals
Speech 610	3	Phonetics
Speech 510	3	Intro. to Speech Correction
Theater 301	3	Elements of Acting
Theater 302	3	Elements of Play Production
Theater 500	3	History of the Theater I
Theater 501	3	History of the Theater II

Electives are listed among the course offerings from which at least 10 hours must be selected to complete the major requirements of 30 semester hours.

REQUIRED COURSES FOR PROFESSIONAL THEATER MAJORS

Speech 250	2	Speech Fundamentals
Speech 610	3	Phonetics
Theater 301	3	Acting
Theater 302	3	Elements of Play Production
Theater 500	3	History of Theater I
Theater 501	3	History of Theater II
Theater 400	3	Scenic Design
Theater 441	3	Stagecraft & Lighting
Theater 440	3	Play Directing
Theater 650	6	Acting or Technical Workshop
Theater 656	3	Advanced Play Directing

Students may elect an additional 15 hours from among departmental course offerings to complete the major requirements of 50 semester hours.

SPEECH AND THEATER EDUCATION

The study of Speech and Theater Education emphasizes first the understanding of communication events in their psychological, social, and philosophical aspects; second, the development of knowledge and techniques for the critical appraisal of public discourse; and third, the acquiring of knowledge and skills requisite to the creation and presentation of effective public discourse.

An extensive activities program complements the academic program of this Department. The Department sponsors programs of co-curricular activities in debate, discussion, and oratory and the programs are open to all students with special interests and ability. Intercollegiate debate competition, which in recent years has been virtually non-existent, is being revised and annually provides an opportunity to the University's Debaters to oppose teams from a number of colleges and universities in both regional and national tournaments.

Students electing to major in this area are also required to enroll in Education Core Courses which will enable them upon graduation to meet the State's Certification requirements for teachers in the secondary schools of North Carolina.

THE SPEECH LABORATORY

The Speech Laboratory provides facilities and equipment for the evaluation and the improvement of the students' voice and diction. The electronic laboratory is used also to implement instruction in speech organization, development, style and the oral interpretation of literature. In short, this facility provides the opportunity to adopt the newer approach to speech training, e.g., listening training to improve comprehension.

PROGRAMS FOR THE SPEECH LABORATORY

The Speech Laboratory encompasses three programs, e.g., Speech Improvement, Speech Therapy, and Listening Comprehension or Listening Training and Practice.

The Speech Improvement Program which could be designated as the "A" Program is designed to provide supervised laboratory practice to develop acceptable or standard pronunciation patterns and a satisfactory, flexible speaking voice. Students enrolled in this program may use substandard dialects and show vocal monotony or abuse that stems from cultural disadvantage. This program would also be advised for any student who desired to increase speech intelligibility and to overcome any non-organic voice inadequacies. Students planning to enter professions or vocations that require exemplary pronunciation patterns and voice usage could benefit from this program as well. Such professions include teaching, law, the ministry, the theater, singing, and television and radio broadcasting.

The Listening Training and Practice Program could be designated as the "B" Program. It is designed to give laboratory instruction and practice to develop both listening comprehension and critical listening ability. This program represents the new stress that is now being placed on the listener in speech instruction.

This program is an integral part of the course in speech fundamentals and would be required of all students enrolled in the course. The content of this program would implement instruction in such speech processes as organization of ideas, choice of ideas, support of ideas and in speech language and style. Students may be asked to attend the laboratory, for instance, to listen to a recorded speech to identify the speaker's lines of reasoning, his pattern of organization, his methods of supporting an idea; or he may be asked to make judgment on the social value of the speaker's ideas. He may also be asked to identify and to evaluate the speaker's language and style.

This program should enable students to cultivate much needed listening skills. A high percent of the average American's time is spent in listening. Listening skill is basic to the teaching-learning process. It is essential in inter-personal relationships and in transactions in government, business, industry, and religion.

PROFESSIONAL THEATER

Studies in theater for the undergraduate major are considered to be a part of the newly acquired Liberal Arts orientation of the University. Students who elect this concentration do not specialize in any one aspect of theater, but receive a liberally oriented theater background which will permit sound specialization after graduation. The concentration emphasizes, first, a substantial background in dramatic literature; second, classroom and directed study of performing arts; and third, presentation of various artistic endeavors in public performance.

The newly constructed A. & T. State University Theater offers laboratories for participation in directing, scene design, acting, playwriting, audience reaction, costuming, and makeup.

Courses in radio-television-film may interest students for several different reasons. Some will want to take one or two courses as part of their general education at the University; various radio-television-film courses may satisfy the general requirements for social studies and humanities credits. Other students take course work in the area as part of their education for a career in which they might expect to use mass communications. Those interested in professional broadcasting careers will find preliminary instruction in radio-television-film which will prepare them for further study.

A. & T. State University operates its own closed circuit radio station, and it is anticipated that its TV station will be functioning by Spring semester 1972. While the radio-television facility will be staffed by a full-time professionally trained person, it is anticipated that some student-staff positions will be available for professionally oriented students.

Majors in professional theater may elect one year of study in two different languages through intermediate levels.

SPEECH

216. Voice and Diction Laboratory.

Credit 1 (0-2)

Supervised practice with the aid of an electronic laboratory in the development of speech intelligibility and an adequate speaking voice. For students whose professional pursuits require above average proficiency in articulation, pronunciation, and voice management; or for students whose substandard speech and voice patterns may come from cultural disadvantages; and for foreign students who wish to increase the intelligibility of their spoken American English. Prerequisite: consent of instructor.

250. Speech Fundamentals.

Credit 2(2-0)

An introduction to the rhetorical psychological, physiological, phonetic, linguistic, and communication bases of oral discourse. Supervised electronic laboratory practice in articulation and voice improvement and listening improvement. Preparation and practice in public address, discussion, oral reading, and interpersonal speech activity. Prerequisite: English 101.

251. Public Speaking.

Credit 3(3-0)

(Formerly English 211, 2426)

A study of the methods by which public speeches are made clear, interesting, and forceful; practice in writing and delivering speeches according to the occasion. Prerequisite: Speech 250.

252. Argumentation and Debate.

Credit 3(3-0)

(Formerly English 312, 2427)

Study and practice in analysis, gathering of material, briefing, ordering of arguments and evidence, refutation, and delivery. Prerequisite: Speech 250.

253. Parliamentary Procedure.

(Formerly English 313, 2428)

Theory and practice in the rules and customs governing organization and proceedings of deliberative bodies. Prerequisite: Speech 250.

335. Rhetoric of American Thought.

Credit 3(3-0)

A critical study of selected American orators—their speech making on controversial social and political issues from 1830-1960, as well as the reaction of their audiences. Black American orators will be included. Prerequisite: Speech 250.

***636. Persuasive Communication.**

Credit 3(3-0)

A study of the theory and practice of persuasive speaking in the democratic society, including formal and informal persuasive speaking, types of proof, and the ethics of persuasion. Some practice in the preparation and delivery of persuasive messages. Prerequisite: Speech 250.

404. Speech Pathology I.

Credit 4(3-2)

Definition, classification, etiology and treatment of articulation disorders. Also, an introduction to clinical procedures in communicative disorders. Supervised observation and limited participation in evaluations, therapy and conferences included in a laboratory. Prerequisite: Speech 102 and junior standing.

405. Speech Pathology II.

Credit 4(3-2)

Definition, classification, etiology and treatment of voice disorders, language disorders, stuttering and cluttering. Prerequisite: Speech 104.

407. Introduction to Audiology.

Credit 3(2-2)

An introduction to hearing sciences, hearing evaluation, hearing conservation and aural rehabilitation. Prerequisite: Speech 102.

420. Group Discussion.

Credit 3(3-0)

(Formerly English 2445)

A study of the forms of discussion and the principles and methods underlying them. Practice in both leading and participating in discussion situations. Prerequisite: Speech 250.

421. Oral Reading and Interpretation.

Credit 2(2-0)

A course designed for Speech and Theater majors and minors and for any student who wishes to improve himself in oral interpretation with the individual and group. Prerequisite: Speech 250.

***510. Introduction to Speech Correction.**

Credit 3(2-2)

(Formerly 2465)

A study of the causes, symptoms, and treatment of minor speech disorders. Observation and practice in clinical techniques. Prerequisite: Speech 410.

539. Methods of Teaching Speech.

Credit 3(3-0)

A study of the aims, objectives, problems and difficulties experienced in teaching speech in the modern school. Special attention is given to the organization and coordination of both speech and theater curriculums, to planning courses of study, its presentation, and to the selection of materials and equipment required of all Speech and Theater Education majors. Prerequisites: 27 hours of Speech and 15 hours of Education and Psychology.

610. Phonetics.

Broad transcription: The International Phonetic Alphabet; Standards of pronunciation; dialectal variations in America; physiological and accoustical bases of speech sounds. Prerequisite: Speech 250 or Consent of Instructor.

* Advanced Undergraduate and Graduates.

THEATER

- 300. Theatre Practice.** Credit 1(0-2)
(Formerly English 215, 2430)

Practical experience in staging and setting up technical designs; backstage work in costume, makeup, stagecraft, lighting, etc., is required.

- 301. Acting.** Credit 3(3-0)
(Formerly English 2431)

A laboratory course designed to develop skill in voice, diction, and Pantomime by means of readings, monologues, skits, and short plays for school and community; practical experience in the major A. and T. productions. Prerequisite: Speech 250.

- 302. Elements of Play Production.** Credit 3(2-2)
(Formerly English 315, 2432)

Study of basic principles in all aspects of production and application of these principles to particular situations; affords opportunities for practical experience in acting, directing, lighting, scenery design, and construction. Prerequisite: Speech 250.

- 400. Scene Design.** Credit 3(3-0)
(Formerly English 2448, 2440)

A course in perspective, dealing with the representation of common objects, interiors, buildings, and landscapes as they appear to the eye. One hour lecture and two hours laboratory each week. Prerequisite: Theater 302.

- 440. Play Directing.** Credit 3(3-0)
(Formerly English 416, 2446)

Elementary principles of staging plays; practical work in the directing of the one-act play; attention is given to the principles of selecting, casting, and rehearsing of plays. Exercises, lectures, and demonstrations. Prerequisite: Theater 301, 302.

- 441. Stagecraft and Lighting.** Credit 3(3-0)
(Formerly English 415, 2447)

Study of principles of scenery construction and painting; practice in mounting productions for major shows. Prerequisite: Theater 302.

- 457. Essentials of Playwriting.** Credit 3(3-0)

Emphasis on creative work and class criticism; structure, characterization and dialogue are studied with reference to standard plays. Prerequisite: consent of instructor.

- 460. Radio Production.** Credit 3(3-0)
(Formerly English 2449)

Practical experience in radio broadcasting techniques and conventional studio practices; projects in radio announcing and acting, creative dramatics, commercial announcements, variety shows, and verse reading. Programs planned and executed by the students. Prerequisite: Speech 250.

- 500. History of the Theater I.** Credit 3(3-0)

A study of theatre architecture, scenery, costume, methods of staging and production in Europe as well as a study of representative playwrights from Ancient Greece to Russia. Prerequisite: Theater 302 or consent of instructor.

- 501. History of the Theatre II.** Credit 3(3-0)

A continuation of Theatre I beginning with Realism, Naturalism, Symbolism, Expressionism, and neo-Romanticism in Theatre down to the Avant-Garde Theatre in Europe. Prerequisite: Theater 302 or consent of the instructor.

Advanced Undergraduate and Graduate**SPEECH**

- 633. Speech for Teachers.** Credit 2(2-0)
(Formerly English 2743)

Study and application of the fundamental principles of oral communication related to teaching and learning; speech activities and interpersonal relations identified both with teaching and learning and the teaching profession; exercises for self-improvement in the various speech processes.

- 634. Introduction to Rhetorical Criticism.** Credit 3(3-0)

A study of the principles and methods underlying the rhetorical analysis and evaluation of public speeches.

- 635. Great Speeches of the Western World.** Credit 3(3-0)

A study of the role of public address in the social, political, and intellectual history of Western man. A reading and critical analysis of selected speeches from Greco-Roman times to the present.

- 736. British Public Address.** Credit 3(3-0)

A study of the history and criticism of British public address through analysis of speeches on political and social issues of the 18th and 19th centuries.

- 737. Communication Theories.** Credit 3(3-0)

The role of spoken communication in social adaptation. Relationships of thought, language, and expression; verbal perception and cognition; communication models and their characteristics.

- 740. Seminar in Speech Education.** Credit 3(3-0)

Methods and materials for teaching speech courses and directing or supervising dramatic, forensic, and speech activities.

THEATER

- 620. Community and Creative Dramatics.** Credit 3(3-0)
(Formerly English 515, 2470)

Theory and function of creative dramatics and applications in elementary education; demonstrations with children; special problems for graduate students.

- 630. Early American Drama and Theatre to 1900.** Credit 3(3-0)

A study of Representative plays in the American Theatre from Early Colonial Period to 1900 as a reflection of national life and culture.

- 631. Modern American Drama and Theatre since 1900** Credit 3(3-0)

A study of significant developments in the American Theatre since 1900 as reflected through her major playwrights and theatre organization.

- 650. Theater Workshop.** Credit 3-6(0-6)

A practicum involving the total theatrical experience. Involves units in acting, directing, stagecraft, designing and other such activities. Approximately 90 clock hours are devoted to technical production. Prerequisite: Senior standing or consent of instructor.

653. Principles and Practice of Stage Costume.

Credit 3(2-2)

The function of costumes for the stage and for television, and their relationship to other elements of dramatic production. Includes research in construction of authentic period forms. Prerequisite: consent of instructor.

654. Problems in Acting.

Credit 3(2-2)

Acting problems arising from differences in the types and style of dramatic production; emphasis on individual and group performance. Prerequisite: Theater 301.

655. Advanced Play Production.

Credit 3(3-0)

A study of modern methods of staging and lighting plays. Directing on a multiple set; arena staging, intellectual values; script analysis. Prerequisite: Theater 302 and 440.

656. Advanced Directing.

Credit 3(2-3)

A consideration of rehearsal problems and techniques as may be reflected in the 3 act play. In conjunction with the acting classes and the Richard B. Harrison Players, students direct projects selected from a variety of genres. Prerequisite: Theater 440.

Recommended Electives

The Department of Speech Communication and Theater Arts recommends the following electives to its majors who are pursuing either the teaching curriculum or the professional curriculum:

Music and Art

Music 404	History and Appreciation
Music 405	Baroque and Romantic Periods
Art 224	Art Appreciation
Art 400	Renaissance Art

Social Science

History 205	United States Since 1865
History 206	History of Africa
History 207	History of the Negro
History 107	Religious and Civilization
Sociology 204	Social Problems
Sociology 306	Minority Problems
Sociology 401	Origins of Social Thought

English

English 300	Advanced Composition
English 221	English Literature II
English 431	American Literature II
English 410	Shakespeare
English 620	Elizabethan Drama
English 752	Restoration and 18th Century British Drama
English 455	Journalism

Physical Education

Physical Education 229	Dance
Physical Education 451	Dance Composition
Physical Education 452	Applied Dance

SPECIAL DEPARTMENTAL ACTIVITIES

Alpha Psi Omega National Dramatic Honor Fraternity (Phi Epsilon Chapter) was chartered at New York University and installed on campus during the Fall semester, 1970. Students of high ability and who are nominated by the department are eligible for membership. See Student Handbook for details.

Black Arts Repertory Company is dedicated to the production of plays and musicals concerned with the experience of the black man in Africa and in the Western Hemisphere. Membership is not restricted to any race or group. Each year's calendar will schedule special productions from the repertoire of black playwrights and other cultural artists.

Richard B. Harrison Players is the regular dramatics organization which is open to all interested students enrolled in the University. The organization presents its plays regularly in the Little Theater which is one of the more efficient facilities for theatrical productions in the nation. The theater seats 371 persons.

DIVISION OF NATURAL SCIENCE AND MATHEMATICS

- **DEPARTMENT OF BIOLOGY**
- **DEPARTMENT OF CHEMISTRY**
- **DEPARTMENT OF MATHEMATICS**
- **DEPARTMENT OF PHYSICS**

DEPARTMENT OF BIOLOGY

ARTIS P. GRAVES, *Chairman*

The program of the Biology Department is designed to serve the needs of the university as a whole in the area of the biological sciences. The undergraduate courses of instruction are organized to provide training necessary for specialization in agricultural sciences, home economics, nursing, horticulture, and the teaching of Biology. The Department offers courses designed to meet the general education requirement of the university and a professional program for entrance into graduate, medical, dental and veterinary schools. A Master of Science degree in Education with concentration in Biology is also offered by the Biology Department.

A student may earn the Bachelor of Science degree in Biology by pursuing either of the two curricula offered by the department. The professional major is designed to meet the needs of students planning a vocation in industry, dentistry, medicine, veterinary medicine, or further graduate studies. The teaching major is designed for Biology majors who desire to meet the requirements for certification as secondary school teachers in North Carolina.

The curricula of the two programs are similarly structured in the freshman and sophomore years. The course requirements of the upper level of these programs vary in that each is geared toward its specific goal.

The Master of Science in Education. A graduate student may earn the Master of Science degree in Education with concentration in Biology by pursuing the thesis or the non-thesis program.

The thesis plan requires a minimum of thirty hours of graduate credit including research for the thesis. Thirty semester hours of graduate credit are also required in the non-thesis plan.

In each of these procedures the minimum required courses in professional education are identical, namely six semester hours. The academic program in each prescribes a minimum of 18 semester hours in subject matter courses for certification in a specific area of concentration. The two programs require six semester hours of free electives that are recommended in the areas of chemistry, physics, mathematics or biology.

In the pursuance of the M.S. in Education Degree with a major in Biology under the non-thesis program, the candidate is required to complete 18 semester hours in biological science. Six semester hours of electives can be selected in the area of chemistry, mathematics, biology or physics. Of the above required 24 hours, 18 are applied to subject matter requirement of the degree and six are prescribed as electives. Six semester hours of professional education courses are also required.

Participants who wish to pursue the degree under the non-thesis plan could receive it by successfully meeting the following requirements:

Major (Biology)	18 semester hours
Education	6 semester hours
Electives	6 semester hours
	<hr/>
	30 semester hours

Professional Major—In the Professional Major, the student is required to complete a minimum of 38 semester hours of Biology. There is also a further requirement of 43 semester hours of supporting courses. The program requires a minimum of 124 semester hours for graduation.

Teaching Major—In the Teaching Major, students are required to complete a minimum of 35 semester hours in Biology. Required supporting courses in this curriculum are 60 semester hours. This program requires a minimum of 124 semester hours for graduation.

REQUIRED COURSES for BIOLOGY MAJORS

1. REQUIRED COURSES IN BIOLOGY FOR PROFESSIONAL MAJORS

<i>Course No.</i>	<i>Credit Hours</i>	<i>Course Title</i>
Biol. 140	4	General Botany
Biol. 160	4	General Zoology
Biol. 121	4	General Microbiology
Biol. 260	4	Comparative Evolution of the Vertebrates
Biol. 465, or	4	Histology
Biol. 664	3	Histo-Chemical Technique
Biol. 466	3	Principles of Genetics
Biol. 561	4	Vertebrate Embryology
Biol. 562	4	Introductory Cell Physiology
Biol. 568	1	Seminar in Biology
Biol. 569	1	Seminar in Biology

SIX CREDIT HOURS TO BE SELECTED FROM THE FOLLOWING COURSES:

Biol. 467	3	General Entomology
Biol. 600	3	General Science for Elementary Teachers
Biol. 640	3	Plant Biology
Biol. 642	3	Special Problems in Botany
Biol. 660	3	Special Problems in Zoology
Biol. 661	3	Mammalian Biology
Biol. 662	3	Biology of Sex
Biol. 663	3	Cytology
Biol. 665	3	Nature Study
Biol. 666	3	Experimental Biology
Biol. 667	3	Animal Biology

2. REQUIRED COURSES IN BIOLOGY FOR TEACHING MAJORS

<i>Course No.</i>	<i>Credit Hours</i>	<i>Course Title</i>
Biol. 140	4	General Botany
Biol. 160	4	General Zoology
Biol. 121	4	General Microbiology
Biol. 260	4	Comparative Evolution of the Vertebrates
Biol. 400	3	Field Biology
Biol. 466	3	Principles of Genetics
Biol. 561	4	Vertebrate Embryology
Biol. 562	4	Introductory Cell Physiology
Biol. 568	1	Seminar in Biology
Biol. 569	1	Seminar in Biology

THREE CREDIT HOURS TO BE SELECTED FROM THE FOLLOWING COURSES:

Biol. 467	3	General Entomology
Biol. 600	3	General Science for Elementary Teachers
Biol. 640	3	Plant Biology
Biol. 642	3	Special Problems in Botany
Biol. 660	3	Special Problems in Zoology
Biol. 661	3	Mammalian Biology
Biol. 662	3	Biology of Sex
Biol. 663	3	Cytology
Biol. 665	3	Nature Study
Biol. 666	3	Experimental Biology
Biol. 667	3	Animal Biology

3. REQUIRED SUPPORTING COURSES FOR PROFESSIONAL MAJORS

<i>Course No.</i>	<i>Credit Hours</i>	<i>Course Title</i>
Chem. 101-111	4	General Chemistry I
Chem. 102-112	4	General Chemistry II
Chem. 221-223	5	Organic Chemistry I
Chem 222-224	5	Organic Chemistry II
Phy. 225	4	College Physics I
Phy. 226	4	College Physics II
Math. 111	4	College Algebra and Trigonometry
Math 113	4	Analytic Geometry and Calculus
Fr 100 or Gr 102	3	Elem. French I or Elem. German I
Fr 101 or Gr 103	3	Elem. French II or Elem. German II
Psy 320	3	General Psychology

4. REQUIRED SUPPORTING COURSES FOR TEACHING MAJORS

<i>Course No.</i>	<i>Credit Hours</i>	<i>Course Title</i>
Chem. 101-111	4	General Chemistry I
Chem. 102-112	4	General Chemistry II
Chem. 221-223	5	Organic Chemistry I
Phy. 225	4	College Physics I
Phy. 226	4	College Physics II
Math. 111	4	College Algebra and Trigonometry
Math. 113	4	Analytical Geometry and Calculus
Fr 100, Gr 102, or Sp 104	3	Elem. French I, Elem Ger. I or Elem. Spanish I
Fr 101, Gr 103, or Sp 105	3	Elem. French II, Elem Ger. II or Elem. Spanish II
Psy 320	3	General Psychology
Ed 300	2	Introduction to Education
Ed 301	2	Phil. and Soc. Found of Education
Ed 400	3	Psy. Found. of Education
Psy 436	3	Tests and Measurements
Ed 500	3	Prin. and Curricula of Sec. Schools
Ed 535	3	Methods of Teaching Science
Ed 560	6	Observation and Student Teaching

COURSES IN BIOLOGY**Undergraduate**

- 100. Biological Science.*** Credit 4(3-2)
(Formerly Biol. Sc. 1501)

This is a general education course that stresses the objectives presented under the general education program of the School of Education and General Studies. It is structured to meet the needs of students who plan to teach (a) at the pre-school level, (b) at the elementary school level, (c) at the secondary level in a non-science mathematics area, and (d) in the area of music. In addition, this course is designed for freshmen who plan to concentrate in the divisions of the Humanities or the Social Sciences.

- 400. Field Biology.** Credit 3(1-4)
(Formerly Biol. 1540)

This course is designed to give a more detailed understanding of the ecological requirements of organisms, their distribution and their way of life. Emphasis is placed on the method of collecting, classifications, and preserving samples of organisms, where and when to find them and the sources of pertinent information regarding them.

COURSES IN BACTERIOLOGY**Undergraduate**

- 120. Microbiology.** Credit 4(2-4)
(Formerly Bact. 1523)

A survey of the principles and techniques of microbiology and immunology with special emphasis on their application to nursing.

- 121. General Microbiology.** Credit 4(2-4)
(Formerly Gen. Bact. 1524)

A general course designed to orient the student within the world of microscopic living things, including yeasts, molds, bacteria, rickettsiae, and viruses. Detailed study is given to bacteria as prototypes of all microorganisms. Relationships among microorganisms and selected macroorganisms (higher plants, animals, man) are emphasized. Prerequisites: Biology 160, 140; Chemistry 101 and 102.

- 420. Dairy Bacteriology.** Credit 4(2-4)
(Formerly Bact. 1543)

A general course which considers some of the common organisms associated with normal, and abnormal fermentations of milk; the role of microorganisms in the production and decomposition of various dairy products is also considered. Prerequisite: Biology 121.

- 421. Soil Bacteriology.** Credit 4(2-4)
(Formerly Bact. 1544)

The role of microorganisms in soil fertility. Special emphasis is on the activity of the nitrogen-fixing bacteria and also those concerned in the decomposition of organic waste materials. Prerequisite: Biology 121.

* General Education Course for Non-Majors

COURSES IN BOTANY**Undergraduate**

- 140. General Botany.*** Credit 4(2-4)
(Formerly Bot. 1507)

Plants as living organisms constituting an integrated part of man's environment. Emphasis is placed on cellular function, plant structure and function, evolutionary tendencies, and living processes.

- 430. Plant Taxonomy.** Credit 4(2-4)
(Formerly Bot. 1527)

Systematic botany, and taxonomic system, botanical nomenclature, and herbarium techniques are combined in this study of selected orders, families, and genera of seed plants. Prerequisite: Botany 140.

- 432. Plant Physiology.** Credit 4(2-4)
(Formerly Bot. 1528)

An elementary course designed to develop a clear understanding of the basic physiological process related to the structure, growth, and function of the seed plants. Prerequisites: Biology 140, Chemistry 101 and 102.

- 530. Plant Pathology.** Credit 4(2-4)
(Formerly Bot. 1547)

Basic factors governing the development of plant diseases including host-parasite relationships, effect of environment on disease development and the nature of disease resistance. Prerequisite: Botany 140.

Advanced Undergraduate and Graduate

- 640. Plant Biology.** Credit 3(2-2)
(Formerly Bot. 1572)

A presentation of fundamental botanical concepts to broaden the background of high school biology teachers. Bacteria, fungi, and other microscopic plants will be considered as well as certain higher forms of plants. The course will consist of lectures, laboratory projects, and field trips.

- 642. Special Problems in Botany.** Credit 3(2-2)
(Formerly Bot. 1573)

Open to advanced students in botany for investigation of specific problems. Prerequisite: Biology 140 or 640.

COURSE IN GENERAL SCIENCE

- 600. General Science for Elementary Teachers.** Credit 3(3-0)
(Formerly Gen. Sci. 1570)

This course will consider some of the fundamental principles of the life and physical sciences in an integrated manner in the light of present society needs.

* General Education Course for Biology Majors.

COURSES IN ZOOLOGY**Undergraduate**

- 160. General Zoology.*** Credit 4(2-4)
(Formerly Zool. 1512)

An introduction to the study of invertebrates and vertebrates with emphasis on cellular physiology and the morphology, and physiology of representative forms.

- 260. Comparative Evolution of the Vertebrates.** Credit 4(2-4)
(Formerly Zool. 1531)

A comparative study of chordate organ systems with rather detailed emphasis on the evolution and organogenesis of primitive chordates, dogfish shark and the cat. Prerequisite: Biology 160.

- 460. Advanced Invertebrate Zoology.** Credit 4(2-4)
(Formerly Zool. 1532)

Comprehensive consideration of the morphology, function, phylogeny, classification and the life histories of representative forms of lower and higher invertebrate groups exclusive of insects. Prerequisite: Biology 160.

- 461. Human Anatomy and Physiology.** Credit 4(2-4)
(Formerly Zool. 1533)

A study of general structure and function of the human body. Not open to Biology majors.

- 465. Histology.** Credit 4(2-4)
(Formerly Zool. 1551)

The microscopic anatomy of cells, tissues and organs with special emphasis on histogenesis, histochemistry and histophysiology. Prerequisite: Biology 160.

- 466. Principles of Genetics.** Credit 3(2-2)
(Formerly Zool. 1552)

Chromosomal mechanisms and the molecular basis of heredity; concept of template surfaces and the replication and genetic organization of DNA. Gene action at the molecular level; gene structure and function; the genetic code; regulation of protein synthesis; cell differentiation and development.

- 467. General Entomology.** Credit 3(1-4)
(Formerly Zool. 1553)

Elementary structure, description, and habits of the principal orders of insects. Laboratory work will consist of collecting, mounting, preserving, and classification of principal insect representatives. Recommended for general science and biological science majors. Prerequisite: Biology 160.

- 468. Economic Entomology.** Credit 3(2-2)
(Formerly Zool. 1554)

Elementary structure, life histories, classification, and control of insect pests and related arthropods. Recommended for students majoring in one of the agricultural sciences. Prerequisite: Biology 160.

* General Education Course for Biology Majors.

- 469. Human Anatomy.** Credit 3(2-2)
(Formerly Zool. 1556)

Lectures, demonstrations and laboratory study emphasizing basic facts and principles of body structure. Not open to Biology majors.

- 560. Human Physiology.** Credit 3(2-2)
(Formerly Zool. 1565)

An introductory course with emphasis placed on basic principles and mechanisms of physiological functioning of body cells, tissues and systems. Required of majors in Physical Education. Not open to Biology majors. Prerequisite: Biology 469.

- 561. Vertebrate Embryology.** Credit 4(2-4)
(Formerly Zool. 1566)

Study of the developmental stages of selected vertebrates. The materials are treated comparatively and consist of amphibian, bird, rodent, and references to mammalian forms. Prerequisite: Biology 260.

- 562. Introductory Cell Physiology.** Credit 4(2-4)
(Formerly Zool. 1567)

A treatment at the molecular level of the fundamental processes in living cells. The biochemistry of cellular constituents, bioenergetics, intermediary metabolism, and the regulatory mechanisms of the cell will be discussed. Prerequisite: Chemistry 221.

- 568. Seminar in Biology.** Credit 1(1-0)
(Formerly Zool. 1568)

A seminar on selected topic and recent advances in the field of plant and animal biology. This course is required of all seniors.

- 569. Seminar in Biology.** Credit 1(1-0)
(Formerly Zool. 1569)

A continuation of Zoology 568.

Advanced Undergraduate and Graduate

- 660. Special Problems in Zoology.** Credit 3(2-2)
(Formerly Zool. 1574)

Open to students qualified to do research in Zoology.

- 661. Mammalian Biology.** Credit 3(3-0)
(Formerly Zool. 1575)

Study of the evolutionary history, classification, adaptation and variation of representative mammals. Prerequisite: Biology 160.

- 662. Biology of Sex.** Credit 3(3-0)
(Formerly Zool. 1576)

Lectures on the origin and development of the germ cells and reproductive systems in selected animal forms. Prerequisites: Biology 140 and 160.

- 663. Cytology.** Credit 3(3-0)
(Formerly Zool. 1577)

Study of the cell with lectures and periodic student reports on modern advances in cellular biology. Prerequisites: Biology 140, 160 and 465.

- 664. Histo-Chemical Technique.** Credit 3(1-4)
(Formerly Zool. 1578)

Designed to develop skills in the preparation of cells, tissues and organs for microscopic observation and study. Prerequisites: Biology 160 and 260.

- 665. Nature Study.** Credit 3(3-0)
(Formerly Zool. 1579)

A study of diversified organisms, their habits, life histories, defenses, sex relationships, periodic activities and economic values designed to acquaint the student with fundamental knowledge that should lead to a fuller appreciation of nature.

- 666. Experimental Embryology.** Credit 3(1-4)
(Formerly Zool. 1580)

A comprehensive lecture-seminar course covering the more recent literature on experimental embryology and development physiology. Experimental studies treating with amphibian, chick and rodent development are designed as laboratory projects. Prerequisite: Biology 561 or equivalent.

- 667. Animal Biology.** Credit 3(2-2)
(Formerly Zool. 1581)

A lecture-laboratory course stressing fundamental concepts and principles of biology with the aim of strengthening the background of high school teachers. Emphasis is placed on the principles of animal origin, structure, function, development, and ecological relationships.

GRADUATE COURSES IN BOTANY

- 740. Essentials of Plant Anatomy.** Credit 3(2-2)
(Formerly Botany 1585)
- 741. Applied Plant Ecology.** Credit 3(2-2)
(Formerly Botany 1586)
- 742. Physiology of Vascular Plants.** Credit 3(2-2)
(Formerly Botany 1587)
- 743. Developmental Plant Morphology.** Credit 3(2-2)
(Formerly Botany 5586)
- 744. Plant Nutrition.** Credit 3(2-2)
(Formerly Botany 5587)

GRADUATE COURSES IN ZOOLOGY

- 760. Projects in Biology.** Credit 2(0-4)
(Formerly Zoology 1588)
- 761. Seminar in Biology.** Credit 1(1-0)
(Formerly Zoology 1589)
- 762. Applied Invertebrate Zoology.** Credit 3(2-2)
(Formerly Zoology 1590)
- 763. Fundamentals of Vertebrate Morphology.** Credit 3(2-2)
(Formerly Zoology 1591)

764. Basic Protozoology. (Formerly Zoology 1592)	Credit 3(2-2)
765. Introductory Experimental Zoology. (Formerly Zoology 1593)	Credit 3(2-2)
766. Invertebrate Biology for Elementary and Secondary School Teachers. (Formerly Zoology 1594)	Credit 3(3-0)
767. Genetics and Inheritance for the Secondary School Teacher. (Formerly Zoology 1595)	Credit 3(2-2)
768. Functional Invertebrate Zoology. (Formerly Zoology 1596)	Credit 3(2-2)
769. Cellular Physiology. (Formerly Zoology 1598)	Credit 4(2-4)
860. Parasitology. (Formerly Zoology 5585)	Credit 3(2-2)
861. Advanced Genetics. (Formerly Zoology 5588)	Credit 3(2-2)
862. Research in Botany. (Formerly Zoology 5592) or	3 Credit Hours
863. Research in Zoology. (Formerly Zoology 5593)	3 Credit Hours

GRADUATE COURSES IN BIOLOGY

703. Experimental Methods in Biology. (Formerly Zoology 1597)	Credit 3(1-4)
704. Seminar in Biology. (Formerly Zoology 1599)	Credit 3(2-2)
700. Environmental Biology. (Formerly Zoology 1589)	Credit 3(2-2)
701. Biological Seminar. (Formerly Zoology 1590)	Credit 1(1-0)
702. Biological Seminar. (Formerly Zoology 1591)	Credit 1(1-0)

DEPARTMENT OF CHEMISTRY

WALTER W. SULLIVAN, *Acting Chairman*

The Department of Chemistry offers two major curricula leading to the Bachelor of Science degree. The curriculum of the professional major is designed to meet the needs of students planning to begin professional careers in chemistry upon graduation, to engage in further study in the field at the graduate level, or planning to enter medical,

dental, or other professional schools. This program requires that the student complete 43 semester hours in basic chemistry courses and four to eight semester hours in advanced chemistry courses. The teaching major is designed to give the student a thorough foundation in chemistry while meeting the requirements for certification as a teacher at the secondary school level. It requires a minimum of 37 semester hours credit in chemistry. This curriculum differs from the customary teaching major in that it provides sufficient training for a professional career in chemistry or in teaching at the secondary school level. One who follows this curriculum could subsequently do bona fide work at the graduate level in chemistry.

It is intended that the two curricula would be identical in the freshman and sophomore years so that a student need not reach a final decision regarding his choice of a profession until the beginning of the third year.

The department offers a combined Bachelor of Science/Master of Science degree program. This curricula is identical in the first two years to the professional major's program leading to the Bachelor of Science degree. It is designed to enable talented undergraduate students to obtain the B. S. and M. S. degrees, in Chemistry, during a five year period of study and research. Any student, who is a rising junior in chemistry, with a grade-point average of 3.0 in chemistry and an overall average of 2.7 will be eligible for this program.

PROFESSIONAL MAJOR CURRICULUM

A. Required Courses in Chemistry

<i>Course No.</i>	<i>Credit Hours</i>	<i>Course Title</i>
Chem. 106	3	General Chemistry VI
Chem. 107	3	General Chemistry VII
Chem. 108	1	Chemistry Orientation
Chem. 116	2	General Chemistry VI Laboratory
Chem. 117	2	General Chemistry VII Laboratory
Chem. 231	2	Quantitative Analysis I
Chem. 232	2	Quantitative Analysis I Laboratory
Chem. 221	3	Organic Chemistry I
Chem. 222	3	Organic Chemistry II
Chem. 223	2	Organic Chemistry I Laboratory
Chem. 224	2	Organic Chemistry II Laboratory
Chem. 441	3	Physical Chemistry I
Chem. 442	3	Physical Chemistry II
Chem. 443	1	Physical Chemistry I Laboratory
Chem. 444	1	Physical Chemistry II Laboratory
Chem. 431	2	Quantitative Analysis II
Chem. 432	2	Quantitative Analysis II Laboratory
Chem. 611	4	Advanced Inorganic Chemistry
Chem. 403	2	Introduction to Chemical Research

B. Required Supporting Courses

Math. 116	5	Engineering Mathematics I
Math. 117	5	Engineering Mathematics II
Math. 300	4	Ordinary Differential Equations
Physics 221	5	General Physics I
Physics 222	5	General Physics II
German 102	3	Elementary German I
German 103	3	Elementary German II
German 425	3	Intermediate Scientific German

Zoology 160	4	General Zoology
Botany 140*	4	General Botany

C. Other Required Courses from which at least 8 hours must be selected to complete the major requirements.

Chem. 301	2	Current Trends in Chemistry
Chem. 610	2	Inorganic Synthesis
Chem. 624	5	Qualitative Organic Chemistry
Chem. 631	3	Electroanalytical Chemistry
Chem. 641	4	Radiochemistry
Chem. 643	2	Introduction to Quantum Mechanics
Chem. 651	5	General Biochemistry

TEACHING MAJOR CURRICULUM

A. Required Courses in Chemistry

Chem. 106	3	General Chemistry VI
Chem. 107	3	General Chemistry VII
Chem. 108	1	Chemistry Orientation
Chem. 116	2	General Chemistry VI Laboratory
Chem. 117	2	General Chemistry VII Laboratory
Chem. 231	2	Quantitative Analysis I
Chem. 232	2	Quantitative Analysis I Laboratory
Chem. 221	3	Organic Chemistry I
Chem. 222	3	Organic Chemistry II
Chem. 223	2	Organic Chemistry I Laboratory
Chem. 224	2	Organic Chemistry II Laboratory
Chem. 441	3	Physical Chemistry I
Chem. 442	3	Physical Chemistry II
Chem. 443	1	Physical Chemistry I Laboratory
Chem. 444	1	Physical Chemistry II Laboratory
Chem. 431	2	Quantitative Analysis II
Chem. 432	2	Quantitative Analysis II Laboratory

B. Required Supporting Courses

Math. 116	5	Engineering Mathematics I
Math. 117	5	Engineering Mathematics II
Math. 300	4	Ordinary Differential Equations
Physics 221	5	General Physics I
Physics 222	5	General Physics II
German 102	3	Elementary German I
German 103	3	Elementary German II
German 425	3	Intermediate Scientific German
Zoology 160	4	General Zoology
Botany 140*	4	General Botany

C. Required Education Courses

Health Ed. 200	2	Personal Hygiene
Education 300	2	Introduction to Education
Education 301	2	Philosophical & Sociological Foundations of Education

* A biology course for which Zoology 160 is a prerequisite may be substituted for Botany 140.

Education 400	3	Psychological Foundations of Education— Growth and Development
Education 500	3	Principles and Curricula of Secondary Schools
Education 535	3	Methods of Teaching Science
Education 560	6	Observation and Student Teaching
Psychology 320	3	General Psychology
Psychology 436	3	Tests and Measurements
English 250	2	Speech Fundamentals
Earth Science 309	3	Elements of Physical Geology

BACHELOR OF SCIENCE—MASTER OF SCIENCE

A. Required Courses in Chemistry

Chem. 106	3	General Chemistry VI
Chem. 107	3	General Chemistry VII
Chem. 108	1	Chemistry Orientation
Chem. 116	2	General Chemistry VI Laboratory
Chem. 117	2	General Chemistry VII Laboratory
Chem. 231	2	Quantitative Analysis I
Chem. 232	2	Quantitative Analysis I Laboratory
Chem. 221	3	Organic Chemistry I
Chem. 222	3	Organic Chemistry II
Chem. 223	2	Organic Chemistry I Laboratory
Chem. 224	2	Organic Chemistry II Laboratory
Chem. 441	3	Physical Chemistry I
Chem. 442	3	Physical Chemistry II
Chem. 443	1	Physical Chemistry I Laboratory
Chem. 444	1	Physical Chemistry II Laboratory
Chem. 431	2	Quantitative Analysis II
Chem. 432	2	Quantitative Analysis II Laboratory
Chem. 611	4	Advanced Inorganic Chemistry
Chem. 732	4	Advanced Analytical Chemistry
Chem. 722	4	Advanced Organic Chemistry
Chem. 641	4	Radiochemistry
Chem. 701	1	Seminar
Chem. 743 or 749	4	Chemical Thermodynamics or Chemical Kinetics
Chem. 799	3	Thesis Research
Chem. 702	5	Chemical Research

B. Required Supporting Courses

Math. 116	5	Engineering Mathematics I
Math. 117	5	Engineering Mathematics II
Math. 300	4	Ordinary Differential Equations
Physics 221	5	General Physics I
Physics 222	5	General Physics II
German 102	3	Elementary German I
German 103	3	Elementary German II
German 425	3	Intermediate Scientific German
Zoology 160	4	General Zoology
Botany 140 or	4	General Botany
Zoology 260	4	Comparative Evolution of the Vertebrates

C. The student must select 5 hours from among 600 and 700 level chemistry courses.

COURSES IN CHEMISTRY**Undergraduate**

- 100. Physical Science.** Credit 3(3-0)
(Formerly Phy. Sc. 1601)

A one semester introductory course designed to make clear the nature of science as an enterprise and illustrate by numerous examples how science really proceeds. Learning experiences are constructed so that they closely approximate real life situations where one has to search for clues and insights from a variety of sources.

- *101. General Chemistry I.** Credit 3(3-0)
(Formerly Chem. 1611)

Introduction to the study of chemistry, atomic structure and periodicity, chemical bonding, states of matter and phase transitions, solutions, and electrolytes. This course is designed for majors in engineering, and other sciences. Chemistry majors may register for this course with departmental approval.

- *102. General Chemistry II.** Credit 3(3-0)
(Formerly Chem. 1612)

A continuation of general chemistry including an introduction to qualitative inorganic analysis. Prerequisite: Chemistry 101.

- *104. General Chemistry IV.** Credit 3(3-0)
(Formerly Chem. 1615)

Introduction to fundamental techniques and concepts in chemistry; includes writing and interpretation of symbols, formulas, equations, atomic structure, composition, and reactions of inorganic compounds. This course is not open to majors in chemistry, physics, biology, mathematics and engineering.

- *105. General Chemistry V.** Credit 3(3-0)
(Formerly Chem. 1616)

A study of elementary organic chemistry and the chemical changes which take place during life processes. Prerequisites: Chemistry 104 or equivalent.

- *106. General Chemistry VI.** Credit 3(3-0)
(Formerly Chem. 1618)

A general chemistry course for chemistry majors which emphasizes basic principles and important theoretical concepts of chemistry. Emphasis is also placed on the development of manipulative skills in the laboratory. Topics discussed will include atomic structure, electronic configuration, wave mechanical model of atom, chemical bonding, states of matter, chemical equilibria, systems of acids and bases, electrochemistry.

- *107. General Chemistry VII.** Credit 3(3-0)
(Formerly Chem. 1619)

A continuation of Chemistry 106. Includes chemistry of important metals and non-metals and a rigorous treatment of qualitative inorganic analysis.

- 108. Chemistry Orientation.** Credit 1(1-0)
(Formerly Chem. 1617)

A series of lectures and discussions on the nature and requirements of and chemical profession; the application of chemistry to modern living; and other selected topics.

110. Physical Science Laboratory

Credit 1(0-2)

A laboratory course designed to bring students into working contact with the essential aspects of scientific experiences. It is in this course that the student develops concrete ideas about the operational meaning of the scientific method and problem solving. Corequisite: Physical Science 100.

***111. General Chemistry I Laboratory.**

Credit 1(0-3)

An introduction to quantitative studies of substances and chemical reactions. Emphasis is also placed on the development of manipulative skills. Corequisite: Chemistry 101.

***112. General Chemistry II Laboratory.**

Credit 1(0-3)

Continuation of Chemistry 111 with an introduction to qualitative analysis. Corequisite: Chemistry 102. Prerequisite: Chemistry 111.

***114. General Chemistry IV Laboratory.**

Credit 1(0-3)

A study of inorganic reactions and substances and their relation to life processes. Corequisite: Chemistry 104.

***115. General Chemistry V Laboratory.**

Credit 1(0-3)

A study of organic reactions and substances and their relation to life processes. Corequisite: Chemistry 105. Prerequisite: Chemistry 114.

***116. General Chemistry VI Laboratory.**

Credit 2(0-6)

A general chemistry laboratory for chemistry majors which emphasizes quantitative studies of substances and chemical reactions such as acid-base studies, redox reactions, and equilibrium reactions. Emphasis is also placed on the development of manipulative skills in the laboratory. Corequisite: Chemistry 106.

***117. General Chemistry VII Laboratory.**

Credit 2(0-6)

A continuation of Chemistry 116 with an introduction to qualitative analysis. Corequisite: Chemistry 107. Prerequisite: Chemistry 116.

221. Organic Chemistry I.

Credit 3(3-0)

(Formerly Chem. 1621)

A study of the hydrocarbons (aliphatic and aromatic) and introduction to their derivatives. Prerequisite: Chemistry 102, 105 or 107.

222. Organic Chemistry II.

Credit 3(3-0)

(Formerly Chem. 1622)

Continuation of the study of derivatives of hydrocarbons and more complex compounds. Prerequisite: Chemistry 221.

223. Organic Chemistry I Laboratory.

Credit 2(0-6)

This laboratory course emphasizes the study of physical and chemical properties of aliphatic and aromatic compounds. Modern instrumentation such as gas and column chromatography, infrared and ultraviolet analyses are used. Corequisite: Chemistry 221.

224. Organic Chemistry II Laboratory.

Credit 2(0-6)

A continuation of Chemistry 223. However, more emphasis is placed on syntheses and qualitative analysis of organic compounds. Corequisite: Chemistry 222. Prerequisite: Chemistry 223.

231. Quantitative Analysis I. Credit 2(2-0)
(Formerly Chem. 331)

Titrimetric and gravimetric analyses including theory and calculations associated with acid-base equilibria, oxidation-reduction, nucleation, and precipitation-complexation processes. Prerequisite: Chemistry 102 or 107, Mathematics 113 concurrently.

232. Quantitative Analysis I Laboratory. Credit 2(0-6)

This laboratory course emphasizes the basic principles of chemical separations. Laboratory studies of gravimetric and titrimetric analyses are also encountered. Corequisite: Chemistry 117, 231.

251. Elementary Biochemistry. Credit 2(2-0)
(Formerly Chem. 1624)

A study of fundamental cellular constituents. Emphasis is placed on physiological applications and analyses. Prerequisites: Chemistry 105 or 222. This course is open to non-chemistry majors only.

252. Elementary Biochemistry Laboratory. Credit 1(0-3)

Elementary biochemical reactions are studied with emphasis placed on applications to biology, home economics and nursing. Corequisite; Chemistry 115 or 224, and 251.

301. Current Trends in Chemistry Credit 2(2-0)
(Formerly Chem. 1641)

A series of lectures and discussions on special problems in chemistry and of the chemical profession not covered in formal courses.

403. Introduction to Chemical Research. Credit 2(0-6)
(Formerly Chem. 1661)

Makes use of the laboratory and library facilities in studying minor problems of research. Prerequisite: Advanced standing and permission of the Department.

431. Quantitative Analysis II. Credit 2(2-0)
(Formerly Chem. 1662)

A study of the theory and the operational features of some of the more important instruments that are currently being used as analytical tools such as ultraviolet, visible-light, and infrared spectrophotometers, electroanalytical instruments, thermometric titrators, fluorimeters, etc. Prerequisite: Chemistry 441. Corequisite: Chemistry 442.

432. Quantitative Analysis II Laboratory. Credit 2(0-6)

This laboratory course features the utilization of modern instruments such as ultraviolet, visible, and infrared spectrophotometers. The student will also utilize electroanalytical instruments and thermometric titrators. Corequisite: Chemistry 431.

441. Physical Chemistry I. Credit 3(3-0)
(Formerly Chem. 1663)

Atomic and nuclear structure, gaseous and crystalline states, physical properties and molecular structure, the laws of thermodynamics, studies of the liquid state, and solutions. Prerequisites: Physics 221, Math. 222, Chemistry 231, and Physics 222, concurrently.

442. Physical Chemistry II. Credit 3(3-0)
(Formerly Chem. 1664)

A study of chemical kinetics, electric conductance, ionic, equilibria, chemical equilibria, phase diagrams, and colloids. Prerequisite: Chemistry 441.

443. Physical Chemistry I Laboratory.

Credit 1(0-3)

Thermodynamic and kinetic studies are emphasized in this course. Corequisite: Chemistry 441.

444. Physical Chemistry II Laboratory.

Credit 1(0-3)

A continuation of Chemistry 443. Corequisite: Chemistry 442.

Advanced Undergraduate and Graduate**610. Inorganic Synthesis.**

Credit 2(1-3)

(Formerly 1670)

Discussion of theoretical principles of synthesis and development of manipulative skills in the synthesis of inorganic substances. Prerequisites: One year of organic chemistry; one semester of quantitative analysis.

611. Advanced Inorganic Chemistry.

Credit 4(4-0)

(Formerly 1671)

A course in the theoretical approach to the systematization of inorganic chemistry. Prerequisites: Chemistry 441, 442, concurrent.

624. Qualitative Organic Chemistry.

Credit 5(3-6)

(Formerly 1776)

A course in the systematic identification of organic compounds. Prerequisite: One year of Organic Chemistry.

631. Electroanalytical Chemistry.

Credit 3(3-0)

(Formerly 1781)

A study of the theory and practice of polarography, chronopotentiometry, potential sweep chronoamperometry and electrodeposition. The theory of diffusion and electrode kinetics will also be discussed along with the factors which influence rate processes, the double layer, adsorption and catalytic reactions. Prerequisite: Chemistry 431 or equivalent.

641. Radiochemistry.

Credit 4(3-3)

(Formerly 1782)

A study of the fundamental concepts, processes, and applications of nuclear chemistry, including natural and artificial radioactivity, sources, and chemistry of the radioelements. Open to advanced majors and others with sufficient background in chemistry and physics. Prerequisites: Chemistry 442 or Physics 406.

642. Radioisotope Techniques and Applications.

Credit 2(1-3)

(Formerly 1783)

The techniques of measuring and handling radioisotopes and their use in chemistry, biology, and other fields. Open to majors and non-majors. Prerequisite: Chemistry 102 or 105 or 107.

643. Introduction to Quantum Mechanics.

Credit 4(4-0)

(Formerly 1784)

Non-relativistic wave mechanics and its application to simple systems by means of the operator formulation. Prerequisites: Math. 222, Physics 222, and Chemistry 442 prior or concurrent.

651. General Biochemistry.
(Formerly 1780)

Credit 5(3-6)

A study of modern biochemistry. The course emphasizes chemical kinetics and energetics associated with biological reactions and includes a study of carbohydrates, lipids, proteins, vitamins, nucleic acids, hormones, photosynthesis, and respiration. Prerequisites: Chemistry 431 and 442.

GRADUATE COURSES

These courses are open to graduate students only. See the bulletin of the Graduate School for course descriptions.

701. Seminar.

Credit 1(1-0)

(Formerly Chem. 1098)

702. Chemical Research.

Credit 2-5(0-4 to 10)

(Formerly Chem. 1085, 1086 & 1087)

711. Structural Inorganic Chemistry.

Credit 2(2-0)

(Formerly Chem. 1685)

715. Special Problems in Inorganic Chemistry.

Credit 2-5(0-4 to 10)

(Formerly Chem. 1088 & 1089)

716. Selected Topics in Inorganic Chemistry.

Credit 2(2-0)

(Formerly Chem. 1686)

721. Elements of Organic Chemistry.

Credit 3(2-3)

(Formerly Chem. 1690)

722. Advanced Organic Chemistry.

Credit 4(4-0)

(Formerly Chem. 1691)

723. Organic Reactions.

Credit 2(2-0)

(Formerly Chem. 1692)

725. Special Problems in Organic Chemistry.

Credit 2-5(0-4 to 10)

(Formerly Chem. 1090 & 1091)

726. Selected Topics in Organic Chemistry.

Credit 2(2-0)

(Formerly Chem. 1693)

727. Organic Preparations.

Credit 1-3(0-2 to 6)

(Formerly Chem. 1694)

731. Modern Analytical Chemistry.

Credit 3(2-3)

(Formerly Chem. 1787)

732. Advanced Analytical Chemistry.

Credit 4(4-0)

(Formerly Chem. 1788)

735. Special Problems in Analytical Chemistry.

Credit 2-5(0-4 to 10)

(Formerly Chem. 1092 & 1093)

736. Selected Topics in Analytical Chemistry.

Credit 2(2-0)

(Formerly Chem. 1786)

741. Principles of Physical Chemistry I.

Credit 4(3-3)

(Formerly Chem. 1789)

742.	Principles of Physical Chemistry II. (Formerly Chem. 1790)	Credit 4(3-3)
743.	Chemical Thermodynamics. (Formerly Chem. 1791)	Credit 4(4-0)
744.	Chemical Spectroscopy. (Formerly Chem. 1792)	Credit 3(2-3)
745.	Special Problems in Physical Chemistry. (Formerly Chem. 1094 & 1095)	Credit 2-5(0-4 to 10)
746.	Selected Topics in Physical Chemistry. (Formerly Chem. 1795)	Credit 2(2-0)
748.	Colloid Chemistry. (Formerly Chem. 1794)	Credit 2(2-0)
749.	Chemical Kinetics. (Formerly Chem. 1793)	Credit 4(4-0)
755.	Special Problems in Biochemistry. (Formerly Chem. 1096 & 1097)	Credit 2-5(0-4 to 10)
756.	Selected Topics in Biochemistry. (Formerly Chem. 1695)	Credit 2(2-0)
799.	Thesis Research. (Formerly Chem. 1799)	Credit 3

DEPARTMENT OF MATHEMATICS

HERBERT M. HEUGHAN, *Acting Chairman*

PURPOSE

In conjunction with the overall purpose and philosophy of the University, the Department of Mathematics believes that its program should be geared to provide training in mathematics that will prepare the student for living and will meet the demands of a democratic and complex society. Its graduates can emerge as capable, well adjusted citizens with a high degree of achievement and intellectual curiosity to cope with the dynamics of any mathematical environment into which they are placed.

PROGRAMS AND OBJECTIVES

The Department of Mathematics offers three programs leading to the bachelor of Science degree.

The three programs are: the baccalaureate degree in engineering mathematics, the baccalaureate degree in mathematics and the baccalaureate degree in mathematics (teacher education).

Students enrolled in either program must pass a comprehensive examination in mathematics.

OBJECTIVES OF THE ENGINEERING MATHEMATICS PROGRAM

1. To prepare the student to do graduate study in applied mathematics.
2. To prepare the student for service in industry and government.
3. To prepare the student for independent investigations in the areas of science and mathematics.
4. To inspire the student with the desire for continued growth in areas of mathematical inquiry.

OBJECTIVES OF MATHEMATICS PROGRAM

1. To prepare the student to do graduate work in the area of mathematics.
2. To prepare the student for independent investigation in the area of mathematics.
3. To inspire the student with the desire for continued growth in areas of mathematical inquiry.

OBJECTIVES OF THE MATHEMATICS PROGRAM (TEACHER EDUCATION)

1. To prepare the student for graduate study in the area of mathematics and professional education.
2. To prepare the teacher of mathematics to present mathematics in a modern, meaningful, stimulating manner at the secondary level.
3. To prepare the teacher with sufficient quantity and quality of mathematics to provide competent counseling in the several opportunities available in mathematics.
4. To develop in the teacher an appreciation for mathematical rigor, and an appreciation of mathematics as an art as well as a tool.
5. To develop in the teacher an understanding of and an appreciation for the development of mathematics from antiquity to the present.
6. To inspire in the prospective teacher a desire for continued growth in areas of mathematical inquiry.

THE ENGINEERING MATHEMATICS PROGRAM***Freshman Year**

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Mathematics 116, 117 ✓ ✓	5	5
Chemistry 101, 102 ✓	4	4
English 100, 101 ✓	3	3
Mechanical Engineering 101, 102 ✓	2	2
Electives or Air or Military Science ✓	1	1
	<hr/> 15	<hr/> 15

* Offered in cooperation with the School of Engineering.

Sophomore Year

Course and Number	Fall Semester Credit	Spring Semester Credit
Mathematics 300, 500.....	4	4
Mathematics 240, 440.....	3	3
Physics 221, 222.....	5	5
History 100, 101.....	3	3
Electives or Air or Military Science.....	2	2
	17	17

Junior Year

Course and Number	Fall Semester Credit	Spring Semester Credit
Mathematics 511, 512.....	3	3
Mathematics 507, 508.....	3	3
Mechanical Engineering 441, 442.....	3	3
English 250.....	2	—
Physics 406.....	—	3
Humanities 200, 201.....	3	3
Health Education 200.....	—	2
Electives.....	3	3
	17	20

Senior Year

Course and Number	Fall Semester Credit	Spring Semester Credit
Physics 400, 600.....	3	3
Mathematics 224, Elective.....	3	3
Mathematics 350, 520.....	3	3
Economics 301, 302.....	3	3
Foreign Language (French or German).....	3	3
Electives.....	3	3
	18	18

REQUIRED COURSES FOR MATHEMATICS MAJORS

The 16 courses required for General Education

Course No.	Course Title	Credit Hours
Ed. 100	Orientation	1
Phy. Ed. 200	Personal Hygiene	2

*Physics 221	General Physics I	5
*Physics 222	General Physics II	5
Physics 406	Introduction to Modern Physics	3
Math. 111	College Algebra and Trigonometry	4
Math. 113	Analytic Geometry and Calculus	4
Math. 221	Analytic Geometry and Calculus	4
Math. 222	Analytic Geometry and Calculus	4
Math. 242	College Geometry	3
Math. 350	Linear Algebra and Matrix Theory I	3
Math. 505	Seminar in Mathematics	1
Math. 507	Intermediate Analysis I	3
Math. 511	Abstract Algebra I	3
Math. (15 hours beyond Math. 507. Must include Math. 508 or Math. 512).		15
Electives		22

REQUIRED COURSES FOR MATHEMATICS MAJORS

(Teacher Education)

The 16 courses required for General Education

<i>Course No.</i>	<i>Course Title</i>	<i>Credit Hours</i>
Phy. Ed. 200	Personal Hygiene	2
Ed. 100	Orientation	1
Ed. 300	Introduction to Education	2
Ed. 301	Philosophical and Sociological Foundations of Education	2
Ed. 400	Psychological Foundations of Education—Growth and Development	3
Ed. 500	Principles and Curricula of Secondary Schools	
Ed. 529	Methods of Teaching Mathematics	
Ed. 560	Observation and Student Teaching	12
*Physics 225	College Physics I	4
*Physics 226	College Physics II	4
Psychology 320	General Psychology	3
Psychology 436	Tests and Measurements	3
*Foreign language	(French or German)	6
Math. 111	College Algebra and Trigonometry	4
Math. 113	Analytic Geometry and Calculus	4
Math. 221	Analytic Geometry and Calculus	4
Math. 222	Analytic Geometry and Calculus	4
Math. 224	Introduction to Probability and Statistics	3
Math. 242	College Geometry	3
Math. 350	Linear Algebra and Matrix Theory I	3
Math. 505	Seminar in Mathematics	1
Math. 507	Intermediate Analysis I	3
Math. 511	Abstract Algebra I	3
Math. (3 hours beyond Math. 507)		3

* General Education courses.

** Must complete a total of 124 hours.

COURSES IN MATHEMATICS**Undergraduate**

- 100. Intermediate Mathematics.** Credit 3(3-0)
(Formerly Math. 3600)

Elementary properties of the real number system, basic algebra through quadratics. Required of students who fail the mathematics entrance examination.

- *101. Freshman Mathematics I.** Credit 3(3-0)
(Formerly Math. 3601)

Axiomatic systems, algebraic structure of the real number system, basic algebra and trigonometry, introduction to analytic geometry and calculus. A passing score on the mathematics entrance examination.

- *102. Freshman Mathematics II.** Credit 3(3-0)
(Formerly Math. 3602)

Continuation of Mathematics 101. Prerequisite: Math. 101.

- 110. Preparatory Engineering Mathematics.** Credit 4(4-2)
(Formerly Math. 3610)

Algebraic properties of the number systems, fundamental operations, exponents and radicals, functions and graphs, solutions of equations and systems of equations, trigonometric functions and identities, inequalities logarithms, progressions, mathematical induction, binomial theorem, permutations and combination and determinants. Prerequisites: 1 unit of high school algebra and 1 unit of high school geometry.

- *111. College Algebra and Trigonometry.** Credit 4(4-0)
(Formerly Math. 3611)

Elementary logic and the abstract nature of mathematics; structure of the real number system, polynomials and rational functions; linear systems and matrices, inequalities; sets, relations functions; trigonometric, logarithmic, exponential functions. Prerequisites: 1 Unit Plane Geometry and 2 Units of High School Algebra.

- 112. Calculus for Non-Mathematics Majors.** Credit 4(4-0)

Basic ideas and concepts of calculus. Methods and techniques in differential and integral calculus. Applications of calculus. Prerequisite: Mathematics 102, 110 or 111. No credit towards a degree in mathematics.

- *113. Analytic Geometry and Calculus.** Credit 4(4-0)
(Formerly Math. 3613)

Analytic geometry of lines and circles; functions, limits and derivatives and applications, integrals and applications, infinite series, general analytic geometry of two and three dimension, functions of several variables, multiple integration, line and surface integral. Prerequisite: Math. 111 or Math. 110.

- 115. Mathematics of Business and Finance.** Credit 3(3-0)
(Formerly Math. 3615)

Simple interest, discount, partial payments, payroll, wages and commission accounts, discounts and mark-ups, retailing, taxes, distribution of ownership, transactions in corporate securities, insurance, compound interest, annuities, amortization and sinking funds. Prerequisites: Math. 111 or Math. 101, or Math. 110.

- 116. Engineering Mathematics I.** Credit 5(4-2)
(Formerly Math. 3616)

A review of the basic principles of preparatory engineering mathematics, analytic geometry of two and three space, differentiation coordinates, infinite sequences and series, partial differentiation and multiple integrals. Prerequisites: Mathematics 110 or two units algebra, one unit geometry, one-half unit trigonometry and a passing score on the placement examination.

- 117. Engineering Mathematics II.** Credit 5(4-2)
(Formerly Math. 3617)

Continuation of Math. 116. Prerequisite: Math. 116.

- 221. Analytic Geometry and Calculus.** Credit 4(4-0)
(Formerly Math. 3621)

Continuation of Math. 113. Prerequisite: 113.

- 222. Analytic Geometry and Calculus.** Credit 4(4-0)
(Formerly Math. 3622)

Continuation of Math. 221. Prerequisite: 221.

- 224. Introduction to Probability and Statistics.** Credit 3(3-0)
(Formerly Math. 3624)

A general course covering fundamentals of statistics, central tendencies, variabilities, graphic methods, frequency distributions, correlations, reliability of measures, theory and methods of sampling, and the descriptive and analytical measures of statistics. Prerequisites: Math 111.

- 240. Introduction to the Programming of Digital Computers.** Credit 3(2-2)
(Formerly Math. 3641)

Flow charts, machine language, eg. FORTRAN, preparation of cards and tapes, number systems, typical programs for solution on standard computers. Mathematical essentials for computer programming; e.g. approximation methods, error functions, iteration schemes, and numerical solutions of equations. Prerequisite: Math. 111 or 102, 110.

- 242. College Geometry.** Credit 3(3-0)
(Formerly Math. 3643)

Postulational Systems. Euclid's Parallel Postulate. A brief study of non-Euclidean geometries. Euclidean Geometry as a special case of other geometrics. Defects of Euclid's system. Prerequisite: High School Geometry and Math. 113 or Math. 116.

- 300. Ordinary Differential Equations.** Credit 4(4-0)
(Formerly Math. 3645)

Solution of linear and non-linear differential equations with application to mechanics and electricity; introduction to elementary difference equations. Prerequisite: Math. 222 or Math. 117.

- 350. Linear Algebra and Matrix Theory I.** Credit 3(3-0)
(Formerly Math. 3667)

Real and complex finite dimensional vector spaces, conjugate spaces, theory of linear transformation, linear operations, matrices, canonical representations, infinite dimensional space with an introduction to functional analysis. Prerequisite: Math. 221 or Math. 116.

- 420. History of Mathematics.** Credit 3(3-0)
(Formerly Math. 3620)

A survey of the development of mathematics by chronological periods, with biographical references, illustrations of national and racial achievements, and discussions of the

evolution of certain important topics of elementary mathematics. Prerequisite: Math. 221.

423. Theory of Equations. Credit 3(3-0)
(Formerly Math. 3623)

Methods of solving cubics, quartics and other higher algebraic equations. Methods of approximating roots, systems of equations, elements of determinants. Prerequisite: Math. 222.

440. Numerical Methods. Credit 3(2-2)
(Formerly Math. 3642)

Study of numerical methods as related to programming techniques covering the following topics, interpolation and extrapolation, approximate solutions of algebraic and transcendental equations, simultaneous linear equations initial-value, characteristic-value, and boundary-value problems, partial differential equations of the hyperbolic, parabolic, and elliptic types. Corequisite: Math. 240.

500. Introduction to Applied Mathematics. Credit 4(4-0)
(Formerly Math. 3646)

Fourier Series and integrals, orthogonal polynomials, transform calculi, residue calculus, special function, boundary value problems, partial differential equations, vectors. Prerequisite: Math. 300.

505. Seminar in Mathematics. Credit 1(1-0)
(Formerly Math. 3660)

Methods of preparing and presenting seminars, presentation of seminars in current developments in mathematics and/or topics of interest which are not included in formal courses. Required of mathematics majors. Prerequisite: Math. 507 or 511.

507. Intermediate Analysis I. Credit 3(3-0)
(Formerly Math. 3662)

A rigorous treatment of the fundamental principles of analysis; limits and continuity sequence and series, differentiability and integrability, analysis of function of several variables. Prerequisite: Math. 222 or Math. 117.

508. Intermediate Analysis II. Credit 3(3-0)
(Formerly Math. 3663)

Continuation of Math. 507. Prerequisite: Math. 507.

511. Abstract Algebra I. Credit 3(3-0)
(Formerly Math. 3664)

Elementary properties of sets, Peano axioms and the construction of the natural number system, properties of the integers, integral domains, groups, rings, fields, vector spaces, lattices and partially ordered sets. Prerequisite: Twenty hours of college mathematics.

512. Abstract Algebra II. Credit 3(3-0)
(Formerly Math. 3665)

Continuation of Math. 511. Prerequisite: Math. 511.

520. Linear Algebra and Matrix Theory II. Credit 3(3-0)
(Formerly Math. 3668)

Prerequisite: Math. 350.

550. Vector Analysis.
(Formerly Math. 3669)

Credit 3(3-0)

A study of the processes of vector analysis, with a treatment of the vector functions and operations as applied in theoretical work. Prerequisite: Math. 500.

Advanced Undergraduate and Graduate

600. Introduction to Modern Mathematics for Secondary School Teachers.
(Formerly Math. 3670)

Credit 3(3-0)

Elementary theory of sets, elementary logic and postulational systems, nature and methods of mathematical proofs, structure of the real number system. Open only to inservice teachers, or by permission of Department of Mathematics.

601. Algebraic Equations for Secondary School Teachers.
(Formerly Math. 3671)

Credit 3(3-0)

Algebra of sets, solution sets for elementary equations, linear equations and linear systems of equations, matrices and determinants with applications to the solution of linear systems. Prerequisite: Math. 600.

602. Modern Algebra for Secondary School Teachers.
(Formerly Math. 3672)

Credit 3(3-0)

Sets and mappings, properties of binary operations, groups, rings, integral domains, vector spaces and fields. Prerequisite: Math. 600.

603. Modern Analysis for Secondary School Teachers.
(Formerly Math. 3673)

Credit 3(3-0)

Properties of the real number system, functions, limits, sequences, continuity, differentiation and differentiability, integration and integrability. Prerequisite: Math. 600.

604. Modern Geometry for Secondary School Teachers.
(Formerly Math. 3674)

Credit 3(3-0)

Re-examination of Euclidean geometry, axiomatic systems and the Hilbert axioms, introduction to projective geometry, other non-euclidean geometries. Prerequisite: Math. 600.

606. Mathematics for Chemists.
(Formerly Math. 3676)

Credit 3(3-0)

This course will review those principles of mathematics which are involved in chemical computations and derivations from general through physical chemistry. It will include a study of significant figures, methods of expressing large and small numbers, algebraic operations, trigonometric functions, and an introduction to calculus.

607. Theory of Numbers.
(Formerly Math. 3677)

Credit 3(3-0)

Divisibility properties of the integers, Euclid algorithm, congruences, diophantine equations, number-theoretic functions, and continued fractions. Prerequisite: Twenty hours of college mathematics.

608. Mathematics of Life Insurance.
(Formerly Math. 3678)

Credit 3(3-0)

Probability, mortality table, life insurance, annuities, endowments, computation of net premiums, evaluation of policies, construction and use of tables. Prerequisite: Math. 224.

- 620. Elements of Set Theory and Topology.** Credit 3(3-0)
(Formerly Math. 3682)

Operations on sets, relations, correspondences, comparison of sets, functions, ordered sets, general topological spaces, metric spaces, continuity, connectivity, compactness, homeomorphic spaces, general properties of T-spaces. Prerequisite: Math. 222.

- 623. Advanced Probability and Statistics.** Credit 3(3-0)
(Formerly Math. 3683)

Introduction to probability, distribution functions and moment-generating functions, frequency distribution of two variables, development of chi-square, student's "t" and "F" distributions. Prerequisite: Math. 224 and 117 or 222.

- 624. Methods of Applied Statistics.** Credit 3(3-0)
(Formerly Math. 3684)

Presents the bases of various statistical procedures. Applications of normal, binomial, Poisson, chi-square, student's "t" and "F" distributions. Tests of hypotheses, power of tests, statistical inference, regression and correlation analysis and analysis of variance. Prerequisite: Math. 224.

- 625. Modern Mathematics for Elementary Teachers I.** Credit 3(3-0)
(Formerly Math. 3685)

This course affords a background of the beginning numbers, concepts and counting, a study of various number bases, and fundamental processes and their application and problem solving. No credit toward a degree in mathematics.

- 626. Modern Mathematics for Elementary Teachers II.** Credit 3(3-0)
Continuation of Math. 625. Prerequisite: Math. 625.

Graduate

These courses are open only to graduate students. For descriptions of them, see the bulletin of the Graduate School.

- 700. Theory of Functions of A Real Variable I.** Credit 3(3-0)
(Formerly Math. 3690)

- 701. Theory of Functions of A Real Variable II.** Credit 3(3-0)
(Formerly Math. 3691)

- 710. Theory of Functions of A Complex Variable I.** Credit 3(3-0)
(Formerly Math. 3692)

- 711. Theory of Functions of A Complex Variable II.** Credit 3(3-0)
(Formerly Math. 3693)

- 715. Projective Geometry.** Credit 3(3-0)
(Formerly Math. 3694)

- 717. Special Topics in Algebra.** Credit 3(3-0)
(formerly Math. 3695)

- 720. Special Topics in Analysis.** Credit 3(3-0)
(Formerly Math. 3696)

DEPARTMENT OF PHYSICS

JASON GILCHRIST, *Chairman*

The specific objectives of the department are as follows:

1. To prepare majors for graduate study.
2. To prepare majors for work in research laboratories.
3. To prepare majors to teach physics and mathematics in high school, who also have a competency in chemistry and biology.
4. To provide majors in other departments with a clear understanding of the laws of physics and their applications.
5. To provide all students with the ability to make meaningful observations, to convert these observations into mathematical language, and to reach logical conclusions.

Three options in physics are provided for our majors. The Professional Option is designed for students who plan to go to graduate school. The Engineering Option is for the student who plans to begin work with a bachelors degree. The Teaching Option is designed for the student who plans to teach in High School.

Professional Option Program

The required physics courses in the professional option curriculum are: Physics 221, 222, 400, 600, 406, 403, 401, 420, 421, 402, 605, 606, 603, 604, 555, 556.

Other required courses include Chemistry 101, 102; Mathematics 116, 117, 240, 300, 500. It is also required to take two semesters of French, German or Russian.

Minimum for Graduation—128 hours

Engineering Physics Option Program

The required physics courses in the engineering physics option curriculum are: Physics 221, 222, 400, 402, 403, 406, 555, 556, 420, 421. It is also required to take any two additional physics courses.

Other required courses include Chemistry 101, 102; Mathematics 116, 117, 300, 500, 240; Mechanical Engineering 101, 335, 337, 200, 361; Electrical Engineering 337, 452.

Minimum for Graduation—129 hours

Teaching Option Program

The required physics courses in the teaching option curriculum are: Physics 221, 222, 400, 403, 406, 420, 421, 557. It is also required to take at least two additional physics courses.

Other required courses include Chemistry 101, 102; Mathematics 111, 113, 221, 222, 300, 240; Biology 140; Zoology 160.

Minimum for Graduation—127 hours

COURSES IN PHYSICS

- *101. Introduction to Astronomy.** Credit 3(3-0)
Fundamentals of Astronomy with emphasis on methods of observation and the solar system. Astronomical instruments, including optical and radio telescopes. The nature of the sun, moon, planets and other objects of the solar system.
- *200. Introductory Physics.** Credit 2(2-0)
A non-laboratory course involving the study of mechanics, heat, electricity, wave motion, and atomic and nuclear phenomena. Recommended for students with limited backgrounds in physics who should review for College Physics or General Physics.
- *201. Survey of Physics.** Credit 3(2-2)
(Formerly Physics 3801)
A one-semester study of selected topics in physics including simple machines, heat, sound, electricity, and light. Prerequisite: Math. 111 or 102.
- *211. Technical Physics I.** Credit 4(2-4)
A study of basic principles of mechanics, heat, wave motion, and sound. Emphasis is placed on applications of physics in modern technology. Prerequisite: Math. 111. Corequisite: Math. 112.
- *212. Technical Physics II.** Credit 4(2-4)
A continuation of Physics 211. Magnetism, electricity, light, and modern physics. Prerequisite: Physics 211.
- *221. General Physics I.** Credit 5(3-4)
(Formerly Physics 3821)
A study of the usual topics of physics with special emphasis on depth of understanding of basic principles. Includes one two-hour period per week for questions, problems, films, demonstrations, etc. Calculus used. Corequisite: Math. 117 or 221.
- *222. General Physics II.** Credit 5(3-4)
(Formerly Physics 3822)
A continuation of Physics 221. Prerequisite: Physics 221.
- *225. College Physics I.** Credit 4(3-2)
(Formerly Physics 3822)
A study of the fundamental principles of mechanics, properties of matter, heat and thermometry, magnetism, electricity, wave motion, sound, light, and atomic physics. Calculus not required. Prerequisite: Math. 113 or 116.
- *226. College Physics II.** Credit 4(3-2)
(Formerly Physics 3826)
A continuation of Physics 225. Prerequisite: Physics 225.
- 400. Physical Mechanics I.** Credit 3(3-0)
(Formerly Physics 3840)
An application of mathematical methods to motion of a particle, damped harmonic oscillator, central field motion, rotating coordinate systems, Fourier series, Lagrange's equations. Vector methods used. Prerequisite: Physics 222. Corequisite: Math. 300.

* These courses may be used to satisfy the general education science requirement.

401. Mathematical Physics. Credit 3(3-0)

Applications of mathematics to solution of physical problems. Selected topics in vector analysis, differential equations, special functions, calculus of variations, eigenvalues and functions, matrices. Prerequisite: Math. 500.

402. Thermodynamics. Credit 3(3-0)
(Formerly Physics 3842)

Includes equations of state, laws of thermodynamics, entropy, fluid flow, heat transfer, single and two-phase mixtures, and statistical mechanics. Prerequisite: Physics 222. Corequisite: Math. 300.

403. Electricity and Magnetism I. Credit 3(3-0)
(Formerly Physics 3843)

Includes DC and AC circuitry theory, Gauss' Law, Poisson and Laplace equations, dielectric and magnetic materials, Maxwell's equations. Prerequisites: Physics 222, Math. 300.

404. Physical Optics. Credit 3(3-0)
(Formerly Physics 3844)

Emphasis on wave phenomena. Includes propagation, reflection, refraction of light, lenses and optical instruments, interference, diffraction, polarization, line spectra, thermal radiation. Prerequisites: Physics 222, Math. 117 or 222.

405. X-Ray Diffraction. Credit 3(3-0)
(Formerly Physics 3845)

An introductory course with emphasis upon the powder method, including x-ray sources, crystal shapes, and determination of unit cell parameters and atomic positions. Prerequisite: Physics 406 or special permission.

406. Introduction to Modern Physics. Credit 3(3-0)
(Formerly Physics 3846)

Quantization of mass, charge, radiation; atomic structure, relativity, theory of solids, natural and artificial radioactivity. Prerequisites: Physics 222 or 226, Math. 222 or 117.

408. Solid State Physics. Credit 3(3-0)
(Formerly Physics 3848)

Structure and imperfections in crystals and metals, energy levels of metals, semiconductors and their applications, insulators. Prerequisite: 222 and preferably 406.

410. Introduction to Special Relativity. Credit 2(2-0)

A study of the relativistic concepts of space and time. Relativistic kinematics, dynamics, and electromagnetic theory. Prerequisite: Physics 406.

420. Physics Seminar I. Credit 1(1-0)
(Formerly Physics 3851)

A study of current developments in physics.

421. Physics Seminar II. Credit 1(1-0)
(Formerly Physics 3852)

A study of current developments in physics.

430. Physics Research I. Variable 1-3
(Formerly Physics 3853)

Involves student participation in research conducted by staff. Prerequisite: Consent of staff.

- 431. Physics Research II.** Variable 1-3
(Formerly Physics 3854)

Involves student participation in research conducted by staff. Prerequisite: Consent of staff.

- 555. Advanced Laboratory I.** Credit 3(0-6)
(Formerly Physics 3865)

A junior-senior level course with groups of experiments involving vacuum systems, magnetic resonance, x-ray diffraction, spectroscopy, and quantization of charge. Prerequisite: Consent of instructor and Physics 406, 403.

- 556. Advanced Laboratory II.** Credit 3(0-6)
(Formerly Physics 3866)

A continuation of Advanced Laboratory I. Prerequisite: Consent of instructor.

- 557. Advanced Laboratory III.** Credit 3(0-6)

A junior-senior level course involving the study and careful performance of a group of experiments in electronic devices as applied to physics. Prerequisite: Junior Classification.

Advanced Undergraduate and Graduate

- 600. Physical Mechanics II.** Credit 3(3-0)
(Formerly Physics 3841)

A continuation of Physics 400. Prerequisites: Physics 400, Math. 500.

- 603. Electricity and Magnetism II.** Credit 3(3-0)
(Formerly Physics 3872)

A continuation of Physics 403. Prerequisites: Physics 403, Math 500.

- 604. Electricity and Magnetism III.** Credit 3(3-0)
(Formerly Physics 3873)

A continuation of Physics 603. Prerequisite: Physics 603.

- 605. Quantum Mechanics I.** Credit 3(3-0)
(Formerly 3874)

Postulates of wave mechanics and Schrodinger equation. Solutions of the Schrodinger equation for the harmonic oscillator, the square well, and the hydrogen atom. Concepts of spin and angular momentum. Approximate solutions of the Schrodinger equation, perturbation theory. Stark and Zeeman effects. Prerequisites: Physics 406 and Math. 500.

- 606. Nuclear Physics.** Credit 3(3-0)
(Formerly Physics 3875)

Nuclear structure, nuclear interactions, radioactive decay, reactions and cross-sections, nuclear forces, and scattering theory. Prerequisites: Physics 406, Math. 500.

- 615. Quantum Mechanics II.** Credit 3(3-0)

The problem of one and two electron atoms. Hydrogen atom and the alkalis. The hydrogen molecule and the molecular bond. The deuteron problem in nuclear physics. Alpha decay. Scattering theory and the nature of the nuclear force. The motion of a particle in a periodic potential and the role of Quantum Mechanics in solids. Operator formalism. Prerequisite: Physics 605.

705. General Physics for Science Teachers I. Credit 3(2-2)
(Formerly Physics 3885)

For persons engaged in teaching. Includes two hours of lecture demonstration and one two-hour laboratory period per week. Emphasis is placed upon understanding the basic principles of physics. Both courses may be combined during a single semester for double credit. For teachers only. Prerequisite: College degree.

706. General Physics for Science Teacher II. Credit 3(2-2)
(Formerly Physics 3886)

A continuation of Physics 705.

707. Electricity for Science Teachers. Credit 2(2-0)
(Formerly Physics 3887)

Includes electric fields potentials, direct current circuits, chemical and thermal emf's electric meters, and alternating currents. For teachers. Prerequisite: College Physics.

708. Modern Physics for Science Teachers I. Credit 2(2-0)
(Formerly Physics 3888)

An introductory course covering the usual areas of modern physics. Both courses may be combined during a single semester for double credit. For teachers only. Prerequisite: College Physics.

709. Modern Physics for Science Teachers II. Credit 2(2-0)
(Formerly Physics 3880)

A continuation of Physics 708.

DIVISION OF SOCIAL SCIENCES

- **DEPARTMENT OF ECONOMICS**
- **DEPARTMENT OF HISTORY**
- **DEPARTMENT OF POLITICAL SCIENCE**
- **DEPARTMENT OF SOCIOLOGY AND SOCIAL SERVICE**

DEPARTMENT OF ECONOMICS

BASIL G. COLEY, *Acting Chairman*

The Department of Economics offers two majors: Economics and Agricultural Economics. The Agricultural Economics majors may choose to concentrate in either Agricultural Business or Agricultural Science. The former is concerned with the business or industrial phase of agriculture; the latter group would be more interested in graduate study and research. The Economics major is organized to equip students for graduate study in the field; careers in government service, industry and business. It also serves as an excellent background for the study of law.

Economics 301, macro economics, and Economics 302, micro economics are prerequisites for all courses in economics except statistics. The sequence of required courses for individual students after prerequisites are met will be recommended by the student's advisor. In general, advance macro and micro courses will follow macro and micro principles respectively. Freshmen will be permitted to take courses in economics only on the recommendation of the advisor.

It is suggested that majors in economics select minors from related disciplines. For those who are able to master higher mathematics it is strongly suggested as an excellent aid in theory.

REQUIRED COURSES FOR ECONOMICS MAJORS*

<i>Course No.</i>	<i>Credit Hours</i>	<i>Course Name</i>
Econ. 301	3	Principles of Economics (macro)
Econ. 302	3	Principles of Economics (micro)
Econ. 305	3	Elementary Statistics
Econ. 410	3	Intermediate Economic Theory
Econ. 420	3	National Income Analysis
Econ. 525	3	Economic Seminar

Electives from which at least 12 hours must be selected to complete the major requirements.

Econ. 310	3	Advanced Statistics
Econ. 401	3	Public Finance
Econ. 405	3	History of Econ/Thought
Econ. 415	3	Money & Banking
Econ. 425	3	Economics of Transportation
Econ. 426	3	Physical Distribution Analysis
Econ. 501	3	Labor Problems
Econ. 505	3	International Economic Relations
Econ. 510	3	Business Cycles
Econ. 515	3	Comparative Economic Systems
Econ. 520	3	Economic Development
Econ. 602	3	Manpower Problems & Prospects
Econ. 610	3	Consumer Economics
Econ. 615	3	Economic, Political & Social Aspects of the Black Experience

* A grade of "C" or better must be obtained in these courses.

REQUIRED COURSES FOR AGRICULTURAL ECONOMIC MAJORS CONCENTRATING IN AGRI-BUSINESS

<i>Course No.</i>	<i>Credit Hours</i>	<i>Course Name</i>
Econ. 301	3	Principles of Economics (macro Econ.)
Econ. 302	3	Principles of Economics (micro Econ.)
Ag. Econ. 330	3	Introduction to Agricultural Economics
Ag. Econ. 332	3	Elements of Farm Management
Ag. Econ. 334	3	Marketing Agricultural Products
Ag. Econ. 436	3	Agricultural Prices
Ag. Econ. 644	3	Statistical Methods in Agricultural Economics I
Ag. Econ. 646	3	Statistical Methods in Agricultural Economics II

At least fifteen hours of major electives must also be taken.

REQUIRED COURSES FOR AGRICULTURAL ECONOMIC MAJORS CONCENTRATING IN AGRICULTURAL SCIENCE

<i>Course No.</i>	<i>Credit Hours</i>	<i>Course Name</i>
Econ. 301	3	Principles of Economics (macro Econ.)
Econ. 302	3	Principles of Economics (micro Econ.)
Ag. Econ. 330	3	Introduction to Agricultural Economics
Ag. Econ. 332	3	Elements of Farm Management
Ag. Econ. 334	3	Marketing Agricultural Products
Ag. Econ. 436	3	Agricultural Prices
Ag. Econ. 438	3	Intermediate Economic Theory
Ag. Econ. 644	3	Statistical Methods in Agricultural Economics I
Ag. Econ. 648	3	Statistical Methods in Agricultural Economics II

At least nine hours of major electives must also be taken.

PROGRAM FOR ECONOMIC MAJORS

Freshman Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
English 100, 101.....	3	3
Mathematics 101, 102	3	3
History 100, 101.....	3	3
Biological Science 100.....	4	—
Physical Science 100	—	4
Military Science 101, 102 or Air Science 101, 102 or Electives	1	1
Physical Education (Men) 101, 103	1	1
Physical Education (Women) 102, 104	—	—
	15	15

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
French 100, 101 or German 102, 103 or Spanish 104, 105	3	3
Health Education 200	2	—
Air Science 201, 202 or Military Science 201, 202 or Electives	—	—
Military Science 201, 202 or Electives.....	1	—
Speech 250	—	2
Humanities 200, 201	3	3
Economics 301, 302.....	3	3
Economics 305, Math 112.....	3	3
*Social Science Elective.....	—	3
	15	17

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Economics 410, Econ. elective	3	3
Economics Electives	3	3
Economics 420, Econ. Elective.....	3	3
Social Science or Bus. Elective.....	3	3
Social Science, Bus. or Math. Elective.....	3	3
	15	15

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Economics 525	—	3
**At least 27 hours of free electives.....	15	12
	15	15

**PROGRAM FOR AGRICULTURAL ECONOMIC MAJORS
CONCENTRATING IN AGRI-BUSINESS**

Freshman Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
English 100, 101.....	3	3
History 100, 101.....	3	3
Mathematics 111, 113	4	4
Physical Science 100	—	—
Biological Science 100.....	—	4
Air or Military Science or Electives.....	1	1
Education 100.....	1	—
	16	15

* History, Political Science, Sociology and Psychology are suggested areas.

** In addition to the social science group listed above, selection of courses to satisfy this requirement should also be made from Business, Mathematics and Agricultural Economics. Computer Programming is strongly recommended and additional mathematics is necessary for successful pursuit of graduate work.

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Humanities 200, 201	3	3
Physical Education 200	2	—
Economics 301, 302	3	3
Psychology 323	—	3
Ag. Econ. 330	3	—
Animal Husbandry 301; Dairy Husbandry 302; Plant Sc. 110 or Poultry Husbandry 317	3	3
Ag. Econ. 644	—	3
Air or Military Science or Electives	2	2
	—	—
	16	17

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Ag. Econ. 332, 334	3	3
Accounting 221, 222	3	3
English 250	—	2
Sociology 203	3	—
Electives (Major Area)	4	6
Electives	3	3
	—	—
	16	17

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Ag. Econ. 436, 646	3	3
Business Administration 451, 452	3	3
Business Administration 572	—	3
Business Administration 578	—	3
Electives (Major Area), Ag. Econ. 438	5	3
Electives (Technical Agriculture)	4	—
	—	—
	15	15

Fifteen (15) hours of major electives—Major electives will be selected from the following courses:

Ag. Econ. 442	(3)	Ag. Econ. 632	(3)
Ag. Econ. 530	(3)	Ag. Econ. 638	(3)
Ag. Econ. 532	(3)	Ag. Econ. 642	(3)
Econ. 410	(3)	Ag. Econ. 646	(3)

**PROGRAM FOR AGRICULTURAL ECONOMIC MAJORS
CONCENTRATING IN AGRICULTURAL SCIENCE**

Freshman Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Education 100.....	1	—
English 100, 101.....	3	3
History 100, 101.....	3	3
Botany 140, Zoology 160	4	4
Mathematics 111, 112	4	4
Air or Military Science or electives	1	1
	<hr/> 16	<hr/> 15

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Ag. Econ. 330, 332	3	3
Chemistry 101, 102	4	4
Ag. Engineering 113	3	—
Animal Husbandry 301	—	3
Plant Sc. 110 or Poultry Husbandry 317	3	3
Air or Military Science or electives	2	2
	<hr/> 15	<hr/> 15

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Humanities 200, 201	3	3
Ag. Econ. 334.....	3	—
Economics 301	3	—
Economics 302	—	3
Accounting 221, 222	3	3
Speech 250	—	3
Sociology 203	3	—
Foreign Language	3	3
	<hr/> 18	<hr/> 15

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Ag. Econ. 436, 644	3	3
Ag. Econ. 646.....	—	3
Business Administration 451, 452	3	3
Mathematics 113.....	4	—
Econ. 410	—	3
Electives, major area	6	6
	<hr/> 16	<hr/> 18

Nine (9) hours of major electives—Major electives will be selected from the following courses:

Ag. Econ. 440	(3)	Ag. Econ. 638	(3)
Ag. Econ. 530	(3)	Ag. Econ. 642	(3)
Ag. Econ. 532	(3)	Ag. Econ. 648	(3)
Ag. Econ. 632	(3)	B.A. 572	(3)
Math 240	(3)		

COURSES IN ECONOMICS

Undergraduate

- *301 Principles of Economics, (macro)** Credit 3(3-0)
(Formerly Ec. 2840)

An introduction to the meaning and scope of economics, economics terminology, and the basic principles as they apply to the whole economy.

- *302. Principles of Economics, (micro)** Credit 3(3-0)
(Formerly Ec. 2841)

An introductory approach to the principles of economics as they relate to individual segments of the society. Emphasis will be placed on diminishing returns, supply, demand and market structures.

- 305. Elementary Statistics.** Credit 3(2-2)
(Formerly Ec. 2865)

An introduction to research methods; measures of central tendency; dispersion and sampling techniques.

- 310. Advanced Statistics** Credit 3(2-2)
(Formerly Ec. 2866)

Introduction to econometrics and quantitative methods used in testing economics hypotheses. The student receives an introduction to the tools of model estimation, linear programming and a study of stochastic processes. Particular emphasis is placed on econometric studies of current economic issues. Prerequisites: Econ. 305 & Math 112.

- 401. Public Finance.** Credit 3(3-0)
(Formerly Ec. 2844)

An analysis is made of the way federal, state, and local government obtain and spend their revenues. Tax theories, incidence and impact are covered. Factors influencing government fiscal policies.

- 405. History of Economic Thought.** Credit 3(3-0)
(Formerly Ec. 2842)

A survey of the history of economic thought from the Middle Ages to John M. Keynes. The course aims to show how, and under what conditions the more important laws and theories become a part of the body of modern economics.

- 410. Intermediate Economic Theory.** Credit 3(3-0)
(Formerly Ec. 2860)

Allocation of resources and distribution of income within various market structures, with emphasis on analytical tools. Prerequisite: Econ. 302.

* Can be used to satisfy General Education requirements for non-economic majors. Do not have to be pursued in sequence.

415. Money and Banking. Credit 3(3-0)
(Formerly Ec. 2864)

An introduction to the classical Keynesian and past Keynesian monetary theories. Also the foundations and practices of Federal monetary policies in achieving various macro goals. Prerequisites: Econ. 301

420. National Income Analysis. Credit 3(3-0)
(Formerly Ec. 2862)

An introduction to the modern theory of the determination of the level of income, employment, and prices; the various theories of money and interest; fiscal and monetary policy. Prerequisite: Econ. 301.

425. Economics of Transportation. Credit 3(3-0)

This course traces the historic development of our nation's transportation system, its role in economic development and its influence on the growth of urban places. Emphasis will be placed on the understanding of the Socio-economic impact of the industry. The relationship of transportation problems to other urban concerns will be explored.

426. Physical Distribution Analysis. Credit 3(3-0)

Analysis of alternative sources of transportation, economics of movement of goods, both in and out of the firm, integration of transportation with production flow, inventory management, warehousing, marketing policies, plant location, with special reference to location theory.

501. Labor Problems. Credit 3(3-0)
(Formerly Ec. 2863)

An introductory course dealing with the efforts of working people to improve their relative position in the economy; the influence of unionism and of government participation are emphasized. The role of management.

505. International Economic Relations. Credit 3(3-0)
(Formerly Ec. 2867)

National specialization and international exchange. The history and significance of international trade among nations of the world.

510. Business Cycles. Credit 3(3-0)
(Formerly Ec. 2868)

The general instability of capitalism and its causes, seasonal fluctuations and the secular trend. Business cycle history and theories. The influence of cycles on government fiscal policy.

515. Comparative Economic Systems. Credit 3(3-0)
(Formerly Ec. 2877)

A description and analytical study of the various systems that have developed in different countries at different times; motivations, production and distribution patterns.

520. Economic Development. Credit 3(3-0)
(New Course)

This course surveys the problem of economic growth and development in modern times and analyzes the present efforts to increase the rate of economic growth. Selected case studies will be drawn from both highly developed nations and lesser developed nations. Special emphasis will be given to disproportioned growth in sectors of the United States' economy.

525. Economic Seminar.
(New Course)

Credit 3(3-0)

The use of economic tools in delineating, analyzing and presenting economic problems that are not included in other courses. This course will include also an exposure to recent developments in economics.

Courses Offered To Advance Undergraduates and Graduates**601. Economic Understanding.**
(Formerly Ec. 2876)

Credit 3(3-0)

An analysis of the institutional organization and functions of the American Economy. Special references will be made to the state of North Carolina. A prerequisite for all graduate students who had no undergraduate courses in Economics and wish to take the graduate courses in economics. No credit toward a degree in Economics.

602. Manpower Problems and Prospects.

Credit 3(3-0)

An analysis of manpower development problems and prospects, with particular reference to the problems of unemployment, underemployment and discrimination. The course will focus on problem measurement, evaluation of existing policy and prospects for achievement of full human resource development. The course will invite an interdisciplinary participation on the part of students and faculty. Prerequisites: Econ. 301 or 302; Econ. 305 or equivalent or consent of instructor.

610. Consumer Economics.

Credit 3(3-0)

This course is designed to acquaint the student with the nature, scope and tools of Consumer Economics. It is particularly oriented to minority groups, thus focusing on the economic choices currently affecting groups with rising incomes and aspirations. The course will consider the economic choices faced by consumers in maximizing satisfaction with limited means.

615. Economic, Political and Social Aspects of the Black Experience.

Credit 3(3-0)

A study of the political, economic and social tools of current public policy treating the subject of race in America. The course will examine the economic and social conditions of income inequality and explore the national commitment to equal opportunity. Special emphasis will be placed on illustrations from North Carolina and adjacent states.

Courses Offered to Graduate Students**701. Labor and Industrial Relations.**
(Formerly Ec. 5882)

Credit 3(3-0)

Two important sectors of the economy are examined—Labor and Management. Historical, public and governmental influences are studied.

705. Government Economic Problems.
(Formerly Ec. 5883)

Credit 3(3-0)

This course will consider the growth of public expenditures and revenues, and debt of the United States; theories of taxation and tax incidence; and the effects of public expenditures and taxes on economic growth.

710. Economic Development and Resource Use.
(New Course)

Credit 3(3-0)

This course deals with resource and economic development in the domestic economy and also a comparison drawn among developed, developing and undeveloped societies.

720. Development of Economic Systems.
(New Course)

Credit 3(3-0)

An analytical approach to the study of various Economic systems, how these systems developed and how they are organized to carry on economic activity.

COURSES IN AGRICULTURAL ECONOMICS**Undergraduate****330. Introduction to Agricultural Economics.**
(Formerly Ag. Ec. 1121)

Credit 3(3-0)

An application of the fundamental principles of economics to agricultural production, marketing, land tenure, leasing arrangements, financing and related economic problems.

332. Elements of Farm Management.
(Formerly Ag. Ec. 1122)

Credit 3(2-2)

Principles which govern the effective organization and operation of the farm firm.

334. Marketing Agricultural Products.
(Formerly Ag. Ec. 1141)

Credit 3(3-0)

Principles and practices of marketing as applied to farm commodities. Form, place, time and possession utility, the ultimate consumer's market, the agricultural industries market, the middleman system, exchange market operation and futures contracts, price determination, reducing marketing costs. Visits will be made to local markets. Prerequisite: Ag. Econ. 330.

336. Agricultural Prices.
(Formerly Ag. Ec. 1142)

Credit 3(2-2)

Information regarding agricultural price changes, index numbers, price determination, seasonal and cyclical price movements, storage problems, and other methods of controlling extreme price fluctuations, government price policy.

440. Resource Economics.
(Formerly Ag. Ec. 1162)

Credit 3(3-0)

Analysis of Economic problems of resources use and management. Perception of and definition of problems in terms of allocation mechanism. Analysis of Economic relationships over time and market externalities with emphasis on welfare implications. Prerequisite: Economics 302.

442. Cooperative Marketing.
(Formerly Ag. Ec. 1163)

Credit 2(2-0)

Early cooperative movements, principles of cooperatives, importance of cooperatives in the United States, problems of organization, management and operation of cooperative endeavors by farmers in buying and selling. Prerequisites: Ag. Econ. 330, 334.

444. Marketing Dairy Products.
(Formerly Ag. Ec. 1164)

Credit 3(2-2)

Economic problems in procuring milk and cream, in processing and distributing fluid milk, cream and manufacturing dairy products; marketing legislation, market news, market methods, including cooperation, consumer demand and price policy. Prerequisite: Ag. Econ. 334.

530. Economics of Food Distribution.

Credit 3(3-0)

(Formerly Ag. Ec. 1165)

Description of market structures and operations in the processing, wholesale and retail distribution of food. The effect of industrial organization and government regulations on the efficiency of the market and consumers demand for food.

532. Agricultural Economics Research.

Credit 3(3-0)

(Formerly Ag. Ec. 1166)

Review of different types of research methodology used in the field of Agricultural Economics. Prerequisite: Consent of the Department Chairman.

Advanced Undergraduate and Graduate**630. Southern Resources in a Changing Economy—A Seminar.**

Credit 3(3-0)

(Formerly Ag. Ec. 1170)

Trends and the formulation of economic and social problems in the South and particularly in North Carolina; labor and capital mobility, agricultural as compared with the industrial, the problem of underemployment, and important phases of current economic development. Prerequisites: Economics 301, Sociology 203 or Ag. Econ. 330.

632. Agri-Business Policy.

Credit 3(3-0)

(Formerly Ag. Ec. 1171)

The place of Agri-business in the National and International economy; the impact of public policy on the industry. An analysis of policy as it relates to, price support programs, finance, trade and resource development. Prerequisite: Ag. Econ. 330.

634. Commodity Marketing Problems.

Credit 3(3-0)

(Formerly Ag. Ec. 1172)

Economic problems arising out of the demand, supply and distribution of specific agricultural commodities; the price making mechanism, marketing methods, grades, values, price, cost, and governmental policy. Not more than two commodities will be studied in any one quarter. Selection of commodities and emphasis on problem areas will be made on the basis of current need; commodities studied will be cotton, tobacco, fruits and vegetables, and grains. Prerequisite: Consent of the Department Chairman.

636. Seminar in Marketing Farm Products.

Credit 3(3-0)

(Formerly Ag. Ec. 1173)

Discussion, reports, consultation and research efforts which throw light on marketing problems of low income farmers in North Carolina, including National and International importance of locally grown products such as tobacco and cotton. Prerequisite: Consent of the Department Chairman.

638. Special Problems in Agricultural Economics.

Credit 3(1-2)

(Formerly Ag. Ec. 1174)

Designed for students who desire to work out special problems in the field of agricultural economics; problem definition, formulation and investigation. Prerequisite: Consent of the Department Chairman.

640. Agri-Business Management.

Credit 3(2-2)

(Formerly Ag. Ec. 1175)

Methods of research, plans, organization, and the application of management principles. Part of the student's time will be spent in consultation with Agri-business firms. Prerequisite: Consent of the Department Chairman.

- 642. Seminar in Agricultural Economics.** Credit 2(2-0)
(Formerly Ag. Ec. 1176)

Discussion reports and an appraisal of current literature on agricultural problems. Prerequisite: Consent of the Department Chairman.

- 644. Statistical Methods in Agricultural Economics I.** Credit 3(2-2)
(Formerly Ag. Ec. 1177)

Statistical methods with special applications to agricultural problems. The statistical table, ratios, percentages, bar charts, line charts, and frequency distribution are used as analytical tools. Prerequisites: Ag. Econ. 330, Econ. 301 or Sociology 203.

- 646. Statistical Methods in Agricultural Economics II.** Credit 3(2-2)
(Formerly Ag. Ec. 1178)

Statistical methods with special applications to agricultural problems. The time series analysis, sampling theory, analysis of variance, and simple correlation are used as analytical tools. This course is a continuation of Ag. Econ. 644.

- 648. Appraisal and Finance of Agri-Business Firms.** Credit 3(3-0)
(Formerly Ag. Ec. 1179)

Principles of land evaluation, appraisal and taxation. The role of credit in a money economy, classification of credit, principles underlying the economic use of credit. The role of the government in the field of credit.

DEPARTMENT OF HISTORY

FRANK H. WHITE, *Acting Chairman*

The Department of History is organized to: (1) contribute to the general education of a student by providing a historical background for the arts, sciences, and technical studies, (2) provide courses for those students who seek preparation for such fields as teaching, law, journalism, the ministry, and government service, (3) prepare the student for graduate study. The department seeks to develop in the student the power of analysis, judgment, and expression in dealing with multiple factors in social development.

MAJOR PROGRAMS

The Department of History offers three fields of preparation leading to the Bachelor of Science degree: the teaching major in history, the non-teaching major, and the major in social science. Each of these programs has its discrete orientation and addresses itself to the needs of the student.

The teaching programs in history and social science are appropriate for students who desire to teach in the secondary school or pursue advanced study. The nonteaching history program is structured to meet the needs of those who are primarily concerned with preparation for advanced study in graduate and professional schools.

THE TEACHING MAJOR IN HISTORY

Students majoring in the teaching program must meet the following requirements: Thirty hours in history courses, 200 level or above, including 204, 205, 303, 304 and eighteen hours of social sciences distributed in at least three fields—anthropology, economics, geography, political science and sociology. Grades of C or better are re-

quired for the major and the related courses. In addition, a student must complete the following courses in professional education. Education 300, 301, 400, 500, 536, and 560; Psychology 320 and 436. One course in Philosophy 260, 261 or 262 is required to complete the major.

REQUIRED COURSES FOR HISTORY (TEACHING)

<i>Course Number</i>	<i>Credit Hours</i>	<i>Course Title</i>
History 204	3	United States, 1492-1865
History 205	3	United States Since 1865
History 303	3	Europe 1648-1815
History 304	3	Europe Since 1815

A minimum of eighteen hours must be selected from the following list to complete the major requirements.

<i>Course Number</i>	<i>Credit Hours</i>	<i>Course Hours</i>
History 206	3	The Afro-American in the United States to 1865
History 207	3	The Afro-American Since 1865
History 209	3	Africa South of the Sahara
History 280	2-3	Sophomore Honors in History
History 300	3	Ancient History
History 301	3	Medieval History
History 302	3	The Renaissance and the Reformation
History 325	3	History of Colonial Latin America
History 330	3	History of The Far East I
History 334	3	Honors in History
History 405	3	History of England
History 407	3	American Diplomatic History
History 410	3	American Constitutional History
History 430	3	Topics in Twentieth Century American History
History 440	3	Russia to 1917
History 441	3	Russia in the Twentieth Century
History 460	3	Senior Program

THE NON-TEACHING MAJOR IN HISTORY

The non-teaching major in history requires a minimum of 30 credits in history courses, 200 level or above, including 204, 205, 303, 304, 460 and 625 with grades of C or better.

Related courses: Eighteen credits are required in the social sciences distributed in at least three fields as follows:

Economics 301, 302, 305 or the equivalent

Political Science 330

Anthropology, geography, and sociology (elect six hours to complete the requirements)

Language Requirement: One foreign language (12 hours) is required through the intermediate level.

Other Requirements: Philosophy (3 credits) and Psychology 320.

REQUIRED COURSES FOR HISTORY NON-TEACHING

<i>Course Number</i>	<i>Credit Hours</i>	<i>Course Title</i>
History 204	3	United States 1492-1865
History 205	3	United States Since 1865
History 303	3	Europe 1648-1815
History 304	3	Europe Since 1815
History 460	3	Senior Program
History 625	3	Seminar in Historical Method

A minimum of twelve hours must be selected from the following courses to complete the major.

<i>Course Number</i>	<i>Credit Hours</i>	<i>Course Title</i>
History 206	3	The Afro-American in the United States to 1865
History 207	3	The Afro-American Since 1865
History 209	3	Africa South of the Sahara
History 280	2-3	Sophomore Honors
History 300	3	Ancient History
History 301	3	Medieval History
History 302	3	The Renaissance and the Reformation
History 325	3	History of Colonial Latin America
History 330	3	The Far East
History 334	3	Honors in History
History 405	3	History of England
History 407	3	American Diplomatic History
History 410	3	American Constitutional History
History 440	3	Russia to 1917
History 441	3	Russia in the Twentieth Century

MAJOR IN SOCIAL SCIENCE

The major in social science is offered with the assistance of other departments. Students pursuing this program must complete the following requirements:

Social Sciences: A minimum of 24 hours must include:

Economics 301, 302

Political Science 330 and one elective from 230, 333, 440, 441, 442 and 542.

Sociology 100

Nine hours from the following courses to complete the requirements. Anthropology 200, geography 200, 210, 319, 322 or 650 and sociology 204-302 concurrent, 301, 304.

History: A minimum of 21 credits must include 204, 205, 303 and 304. Nine hours of electives must be selected from 206, 207, 209, 280, 300, 301, 302, 325, 330, 331, 334, 405, 407, 410, 440, 441 and 460 to complete the requirements.

REQUIREMENTS FOR TEACHER CERTIFICATION

In addition, the student will take courses in education and psychology to meet teacher certification requirements (See Suggested Professional Education Sequence).

Education 300, 301; Psychology 320 Sophomore Year

Education 400, Psychology 436 Junior Year

Education 500, 536, 560 Senior Year

THE MINOR IN HISTORY

Requirements for the minor in history consist of 18 credit hours including 204, 205, 303 and 304.

COURSES IN HISTORY

Undergraduate

- *100. History of World Civilization—Part I.** Credit 3(3-0)
(Formerly Soc. Sc. 2800)
A freshman survey course in World Civilization. Part I treats the period from the Ancient World through the 17th Century.
- *101. History of World Civilization—Part II.** Credit 3(3-0)
(Formerly Soc. Sc. 2801)
A continuation of World Civilization treating the period from the Age of Enlightenment to the present.
- *105. History of Africa.** Credit 3(3-0)
(Formerly History 2802)
A study of basic information about Africa: the geography of the continent, the characteristics of the population, the varying social structures, the natural resources, and the multiplicity of languages. Treated also in a thorough manner is the effect of European encroachment.
- *107. Religions and Civilization.** Credit 3(3-0)
(Formerly History 2806)
A course that surveys the origins and development of the traditional religions of India and China and the three "Religions of the Book": Judaism, Christianity, and Islam.
- 204. United States From 1492-1865.** Credit 3(3-0)
(Formerly History 2822)
A survey of the social, political and economic forces resulting in the development of the American Nation.
- 205. United States Since 1865.** Credit 3(3-0)
(Formerly History 2823)
A synthesis of social, cultural, economic and political forces affecting the United States since 1865.
- 206. The Afro-American in the United States to 1865.** Credit 3(3-0)
(Formerly History 2825)
The African background, American slavery, abolition movement, social and cultural forces in the development of the Negro in the United States.
- 207. The Afro-American in the United States Since 1865.** Credit 3(3-0)
A continuation of History 206. Particular emphasis is placed upon the struggle for equality.
- 208. History of North Carolina.** Credit 3(3-0)
(Formerly History 2826)
A general survey of North Carolina from colonial times to the present.

209. Africa South of the Sahara. Credit 3(3-0)

The formation of West African states, the European impact on the social, political, and cultural African institutions. African nationalism and the formation of new African nations.

280. History Honors. Credit 2-3(2-0)

An investigation in some depth of a period, movement, theme, or historical problem. 2-3 credits (2 credits for reports on intensive readings; 3rd credit for an approved study—investigation paper—to be arranged with an instructor). Prerequisite: For sophomores with a 3.0 average and consent of the department. May be repeated with the consent of the department.

300. Ancient History. Credit 3(3-0)
(Formerly History 400)

A brief survey of Egyptian, Babylonian, and Hebrew Civilization. Emphasis will be placed on the cultural, political, and economic development of Greece and Rome.

301. Medieval History. Credit 3(3-0)
(Formerly History 401)

Emphasis is placed on the rise and decline of the universal church feudalism, the rise of towns, and the development of centralized governments.

302. The Renaissance and the Reformation. Credit 3(3-0)
(Formerly History 402)

A study of the background, causes and progress of the intellectual and cultural movements in Europe in the fourteenth, fifteenth, and sixteenth centuries. Emphasis will also be placed on the influence of the renaissance of the events leading to the world conflicts of the sixteenth century.

303. Europe 1648-1815. Credit 3(3-0)
(Formerly History 403)

This course deals with such major themes as the Age of Louis XIV, Eighteenth Century Enlightenment, The Old Regime, the French Revolution and Napoleon.

304. Modern Europe Since 1815. Credit 3(3-0)
(Formerly History 404)

A survey emphasizing main trends in European development; political and social impact of the French Revolution; Industrial Revolution; authoritarianism vs. liberalism; church vs. state; nationalism; imperialism; World Wars I and II; Communism, Nazism, present-day Europe.

312. Blacks in the Caribbean. Credit 3(3-0)
(Formerly History 110)

A history of the social, economic, and political development of Blacks in the West Indies and the Caribbean.

325. History of Colonial Latin America. Credit 3(3-0)
(Formerly History 502)

A survey dealing with the exploration and settlement, political, economic, and social development of Latin America concluding with the wars for independence.

326. History of Republican Latin America. Credit 3(3-0)
(Formerly History 502)

A continuation covering Latin America History from Independence to the present time.

- 330. History of The Far East I.** Credit 3(3-0)
(Formerly History 503)

A study of the history and culture of the Chinese and Japanese peoples from the classical civilization to the arrival of European nations.

- 331. History of the Far East II.** Credit 3(3-0)
(Formerly History 504)

A study of the modern history of the Far East, an analysis of the reaction of China, Japan, and Korea to the western powers and the growth of these nations into modern powers.

- 334. Honors in History.** Credit 3(3-0)

Intensive reading and study in the field of history. For history majors with a 3.0 average.

- 405. History of England.** Credit 3(3-0)
(Formerly History 2855)

A study of English institutions and concepts that influenced the Western World, and particularly America. Concentration of The Tudor and Stuart periods in the survey of institutions, and British imperialism as the basis for present world problems.

- 407. American Diplomatic History.** Credit 3(3-0)
(Formerly History 2857)

A study of the relations of the United States with other nations with special reference to the development and use of the economic, political, social, military, and naval power necessary to give support to policy.

- 410. American Constitutional History.** Credit 3(3-0)
(Formerly History 500)

A study of the constitutional development of the United States from the adoption of the Constitution to the present time.

- 416. History of Black Culture in the United States.** Credit 3(3-0)

Focus on early cultural developments, folk culture, and religion in antebellum America; social and cultural trends in the twentieth century; the "Harlem Renaissance"; Urban life.

- 420. Seminar: Urban America.** Credit 3(3-0)

Special topics in the rise of the American city and the development of urban patterns of life. Concentration on such themes as population shifts to cities, the development of slums and ghettos, growth of municipal institutions and services, and the relationship of government with city residents. (Prerequisite: 205 and consent of the instructor).

- 430. Topics in Twentieth Century American History.** Credit 3(3-0)

In depth analysis of selected topics since the late nineteenth century, with special emphasis on written historical communication. Prerequisite: Six hours of American history (204 and 205) and the consent of the instructor.

- 440. Russia to 1917.** Credit 3(3-0)

A study of Russian history from earliest times to the downfall of the Romanov dynasty in 1917. Emphasis is on those characteristics which contribute to the understanding of contemporary Russia.

- 441. Russia in the Twentieth Century.** Credit 3(3-0)
(Formerly History 406)

After a survey of the background to the Revolution of 1917, topics include the Bolshevik Revolution, subsequent development and expansion of the Soviet Union.

460. Senior Program.

Credit 3(3-0)

Guided readings and research for senior students concentrating in history. Required of history majors. Open to seniors only.

Courses for Advanced Undergraduates and Graduates**600. The British Colonies and the American Revolution.**

Credit 3(3-0)

(Formerly History 2878)

The evolution of colonial institutions, growth of the American colonies, the American Revolution and its aftermath.

603. The Civil War and Reconstruction.

Credit 3(3-0)

(Formerly History 2881)

This course begins with a summary of the Civil War. It then treats the historiography of the Reconstruction period, the reconstruction of the South, and the restoration of the Union.

604. Contemporary History of the United States.

Credit 3(3-0)

(Formerly History 2882)

The United States from the Great Depression of the 1930's to the present. Depression, New Deal, prosperity, Second World War, Cold War, and problems of contemporary America.

605. The Soviet Union Since 1917.

Credit 3(3-0)

(Formerly History 2883)

A discussion of the ideological background of the Soviet Union with emphasis on the doctrines of Marx, Engels, and Lenin. This is followed by events leading up to the revolution of 1917 and the establishment of Communist autocracy, the new economic policy, the first Five-year Plan, Stalin's doctrine, and Soviet Communism since the death of Stalin.

615. Seminar in the History of Black Americans.

Credit 3(3-0)

A reading and discussion course which gives concentrated attention to various aspects of the life and history of the Afro-Americans.

616. Seminar in African History.

Credit 3(3-0)

Reading and discussion of selected topics in the history of Africa.

620. American Social and Cultural Forces to 1865.

Credit 3(3-0)

A study of the social and cultural forces in the development of society in the United States to 1865.

621. Social and Cultural Forces in the United States Since 1865.

Credit 3(3-0)

A continuation of History 620. It is also open to those who wish to take the course separately.

625. Seminar in Historical Method.

Credit 3(3-0)

Research and training in historical writing culminating in the presentation of a research paper.

630. Studies in European History, 1815-1914.

Credit 3(3-0)

(Formerly History 703)

An intensive study of the main problems in selected periods of Nineteenth Century European history.

- 631. Studies in Twentieth Century Europe, 1914 to the Present.** Credit 3(3-0)
(Formerly History 707)

Reading course in Contemporary European History, 1914 to the Present.

Courses for Graduates Only

- 700. The French Revolution and Napoleon.** Credit 3(3-0)
(Formerly 2888)
- 701. Recent United States Diplomatic History.** Credit 3(3-0)
(Formerly 2889)
- 702. Social and Political History of England
From 1714-1832.** Credit 3(3-0)
(Formerly 2890)
- 704. United States in The Early Twentieth Century.** Credit 3(3-0)
(Formerly History 2894)
- 706. Independent Study in History.** Credit 3(3-0)
(Formerly History 2894)
- 712. The Black American in The Twentieth Century.** Credit 3(3-0)
- 730. Seminar in History.** Credit 3(3-0)

PHILOSOPHY

- *260. Introduction to Philosophy.** Credit 3(3-0)
(Formerly Philosophy 2904)

An introductory course covering such topics as theories of reality, the nature of mind and knowledge, and the higher values of life.

- *261. History of Philosophy.** Credit 3(3-0)
(Formerly Phil. 2905)

The history of philosophic thought is traced from ancient Greek philosophers to modern philosophers through Hegel.

- *262. Logic.** Credit 3(3-0)
(Formerly Phil. 2906)

An introductory course designed to give a critical analysis of the principles, problems and fallacies in reasoning.

Advanced Undergraduate and Graduate

- 608. Culture and Value.** Credit 3(3-0)
(Formerly Phil. 5970)

A critical study of the nature and justification of basic ethical concepts in light of historical thought.

- 609. Contemporary Philosophy.** Credit 3(3-0)
(Formerly Phil. 5971)

A critical investigation of some contemporary movements in philosophy with special emphasis on existentialism, pragmatism, and positivism.

COURSES IN GEOGRAPHY**Undergraduate**

- *200. Principles of Geography.** Credit 3(3-0)
(Formerly Geog. 518)
A survey of the principles of geography.
- *210. World Regional Geography.** Credit 3(3-0)
A survey of the geographic character of the major culture regions of the world. Contemporary cultural characteristics are examined within the framework of both environmental relationships and historical development.
- 319. Regional Geography of Anglo-America.** Credit 3(3-0)
(Formerly Geog. 519)
A study of the geographic regions of the United States and Canada.
- 320. Economic Geography of Latin America.** Credit 3(3-0)
(Formerly Geog. 520)
The agricultural and industrial resources of Latin America, including the utilization of Negro labor, and the assimilation of African culture into Latin-American life.
- 321. Political Geography.** Credit 3(3-0)
(Formerly Geog. 521)
Theories of political geography; territorial changes and their political significance; problems in political unification, centralization and federation. Prerequisite: Political Science 230 or 330.
- 322. Economic Geography.** Credit 3(3-0)
(Formerly Geog. 522)
A geographical survey of major economic activities as agriculture, forestry, fishing, mining, manufacturing, and commerce. Emphasis is placed upon areal patterns of production and exchange.

Advance Undergraduate and Graduate

- 650. Physical Geography I.** Credit 3(3-0)
(Formerly Geog. 605)
A study of the surface of the earth, including means of representation of the earth's surface, physical elements of weather and climate, climatic regions, and the earth's waters and elements.
- 651. Physical Geography II.** Credit 3(3-0)
(Formerly Geog. 606)
A continuation of Physical Geography I concentrating on climate and weather, natural vegetation and animal life, soils and association of physical landscape attributes.
- 640. Topics in Geography of Anglo-America.** Credit 3(3-0)
(Formerly Geog. 610)
Selected topics in cultural geography of the United States and Canada are studied intensively. Emphasis is placed upon individual reading and research and upon group discussion.

641. Topics in World Geography.
(Formerly Geog. 620)

Credit 3(3-0)

Selected topics in world geography are studied intensively. Concern is for cultural characteristics and their interrelationships with each other and with habitat. Emphasis is upon reading, research, and discussion.

DEPARTMENT OF POLITICAL SCIENCE

AMARJIT SINGH, *Acting Chairman*

In keeping with the general objectives of the University, the offerings in this department are designed to accomplish the objectives listed below with respect to the Political Science major.

THE DEPARTMENTAL MAJOR

The Political Science major is designed to impart to students a background and understanding of the various aspects of government and their operation, to impart to students a background whereby they may do further study leading to careers in government, and to serve as prelaw preparation for those desiring to choose law as a career, as well as preparation for graduate study other than law.

A major in the area of Political Science requires a minimum of 30 semester hours.

A minor may be secured in Political Science.

A minimum of 124 hours are needed for graduation.

SPECIFIC OBJECTIVES OF THE DEPARTMENT OF POLITICAL SCIENCE

1. To develop a basic understanding of man as a political entity.
2. To develop a basic understanding of the operation of government at various levels.
3. To develop competence in the language and skills of the discipline.
4. To develop an inclination among the students to keep abreast of the latest developments in the discipline.
5. To develop an understanding of the workings of various political systems (western and nonwestern) and interaction among them.
6. To develop a sense of relevance in political science to other social sciences.
7. To develop a sense of tolerance for minority views, divergent views and unpopular beliefs.
8. To develop a frame of reference for continued investigation and research in political science.
9. To encourage students to engage in constructive criticism of the political and social problems.
10. To impart such basic knowledge of political science as would encourage students to seek careers in the various aspects of national and international organizations.
11. To promote self-enrichment.
12. To prepare students for advanced study.

REQUIRED COURSES FOR POLITICAL SCIENCE MAJORS

<i>Course No.</i>	<i>Credit Hours</i>	<i>Course Name</i>
Pol. Sc. 230	3	Introduction to Political Science
Pol. Sc. 330	3	Federal Government
Pol. Sc. 440	3	Political Theory
Pol. Sc. 441	3	State Government
Pol. Sc. 443	3	Public Administration

MAJOR IN POLITICAL SCIENCE**Freshman Year**

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
English 100, 101.....	3	3
Mathematics 101, 102.....	3	3
History (see below).....	3	3
Physical Science 100.....	—	4
Biological Science 100.....	4	—
Education 100.....	1	—
Physical Education (men) 101, 103.....	1	1
Physical Education (women) 102, 104.....		
*English 102.....		1
**Elective.....		
	16	16

The following History courses may be elected by Freshmen students to satisfy the core requirements: 100, 101, 105, 107, 109

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
French 100, 101 or German 102, 103 or Spanish 101, 105.....	3	3
Speech 250.....	2	—
Health Education 200.....	—	2
History 204, 205.....	3	3
Humanities 200, 201.....	3	3
Political Science 230.....	3	—
Psychology 320.....	—	3
Electives.....	3	3
	17	17

* For those Freshmen who failed the Reading Test

** The Freshman-Sophomore elective considers the possible choice of Air Science or Military Science.

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Political Science 330, 441	3	3
Political Science 440, 443	3	3
Elective Political Science	3	3
Economics 301, 302	3	3
Philosophy 260 or 261 or 262	—	3
*Electives	3	3
	<hr/> 15	<hr/> 16

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Elective Political Science	3	3
Elective Political Science	3	3
History 410	3	—
Economics 305 or Business Administration 451	3	—
*Electives	3	3
	<hr/> 15	<hr/> 9

COURSES IN POLITICAL SCIENCE*Undergraduate*

- *230. Introduction to Political Science.** Credit 3(3-0)
(Formerly Political Science 2829)

This course treats the terminology and concepts of Political science including such themes as politics and functions of governments, political behavior, constitutional systems, local government and federalism, individual rights of man, political representation, and governmental agencies and processes. A prerequisite to all other political science courses for political science majors.

- 330. Federal Government.** Credit 3(3-0)
(Formerly Pol. Sc. 2941)

A general introductory course in the government of the United States designed to acquaint the student with the basic facts and principles of the organization and operation of Federal institutions, and to give a foundation for more advanced work in Political Science. Prerequisite: Political Science 230 and History 205.

- 331. The Struggle for Political Equality.** Credit 3(3-0)
(Formerly Pol. Sc. 2914)

A comprehensive study of the Black man and minority groups in the United States to achieve political equality and equal justice before the law. It is structured around three

* Electives should be in *one* of the following areas: History, Economics, Sociology, English, and Psychology to complete the requirements for a cognate area.

main areas: (1) the political assumptions, ideologies and thought patterns of the architects of civil rights legislation; (2) the politics of protest—black political activity and allied group pressure attempts to secure equal rights. Such movements considered: the Abolitionist Movement, the Marcus Garvey Movement, Black Church protest, the NACCP, CORE, SNCC, SCLC and the more militant protests; Government and minority groups—special emphasis will be placed here on judicial interpretation as it has affected minorities on the national, state and local level.

333. Introduction to Political Research. Credit 3(3-0)
(Formerly Pol. Sc. 2815)

Students are introduced to fundamental methods and procedures in the collecting and analyzing of political data. Research on a specific political subject is required. Open to seniors only.

440. Political Theory.
(Formerly Pol. Sc. 2940)

An in-depth treatment of the growth and development of this area of Political Science and its relevance to the field. The approach considers ancient and medieval thought as a unit and modern political thought as a separate unit.

441. State Government. Credit 3(3-0)
(Formerly Pol. Sc. 2942)

A study of the structure and functions of state government in the United States and its relation to federal and local governments. Special consideration is given to contemporary problems. Prerequisite: Pol. Sc. 230.

442. Municipal Government. Credit 3(3-0)
(Formerly Pol. Sc. 2943)

A study of municipal government in the larger context of local government as a whole. Treated will be form and structure, trends, economic developments, governments and politics, the power structure, the role of the citizen. A two-hour laboratory period is designed to import practical experience for the student. Open to juniors and seniors only.

443. Public Administration. Credit 3(3-0)
(Formerly Pol. Sc. 2944)

Emphasis is devoted to basic principles of organization, location of authority, fiscal management, personnel management, forms of administrative action in the public service, technological and managerial advancements. Prerequisite: Pol. Sc. 230, 330.

444. International Relations. Credit 3(3-0)
(Formerly Pol. Sc. 2945)

A comprehensive treatment of the policies and politics of nations: imperialism, colonialism, balance of power, international morality, treaties, sovereignty, diplomacy, tariff, war and other arrangements. Prerequisite: Pol. Sc. 330.

445. Problems of Contemporary Africa. Credit 3(3-0)
(Formerly Pol. Sc. 2815)

Consideration of liberation struggles, decolonization and the emerging of independent states, and efforts toward Pan-Africanism since World War II.

446. Politics of the Black African Revolution. Credit 3(3-0)
(Formerly Pol. Sc. 2912)

A look at the development of resistance to white colonialism, neo-colonialism, and general international relations.

447. Contemporary American Political Thought. Credit 3(3-0)
(Formerly Pol. Sc. 2917)

A study of contemporary American political theories and ideas ranging from William Buckley to Herbert Marcus and Stokely Carmichael to Martin Luther King emphasis will be placed on the understanding, studying, evaluating, and meaningful alternative to our present government. Prerequisite: Federal Government, State and Local Government, a good understanding of existing forces in contemporary American politics, and consent of instructor.

448. Politics of Transportation. Credit 3(3-0)

Analysis of political roots of various transportation problems such as highway location issues, mass transit bond issues, and politics of transportation innovation. The working mechanisms of federal, state and local transportation related units will also be considered. Case studies of local, regional and national issues will be included. Prerequisite: Junior status.

505. Honors Seminar in Political Science. Credit 3(3-0)
(Formerly Pol. Sc. 2816)

For superior students (seniors). A thorough examination of selected political works, primarily paperbacks. A treatment of selected political philosophies and ideas for informal discussion. Several critical reviews will be required.

540. American Foreign Policy. Credit 3(3-0)
(Formerly Pol. Sc. 2964)

An analysis of principles and problems of American Foreign Policy from 1789 to the present. Prerequisite: Pol. Sc. 330.

541. Party Politics and Pressure Groups. Credit 3(3-0)
(Formerly Pol. Sc. 2965)

This course deals with modern political parties in the United States as instruments of popular government. Special emphasis is placed upon party structure, functions and operations as it relates to the Negro. Prerequisite: Pol. Sc. 230.

542. American Constitutional Law. Credit 3(3-0)
(Formerly Pol. Sc. 2966)

A case study of major Supreme Court Decisions, the Judiciary, the Congress, the President, the Federal System, the First Amendment Freedoms and Due Process Rights.

543. International Law. Credit 3(3-0)
(Formerly Pol. Sc. 2967)

A study of the major principles and practices in the development of the Law of Nations, utilizing significant cases for purposes of clarification. Prerequisites: Pol. Sc. 230, 444.

544. International Organization. Credit 3(3-0)
(Formerly Pol. Sc. 2968)

This course analyzes the role of the international organization in world politics. Particular emphasis is given to the various approaches of international organizations in fostering peace and economic and social cooperation. Some attention will be given to the United Nations system as well as such defense, political, and economic arrangements as NATO, OSA, SEATO and the European Communities. Prerequisites: Pol. Sc. 230, 541, 543.

Courses for Advanced Undergraduates and Graduates

- 640. Federal Government.** Credit 3(3-0)
(Formerly Pol. Sc. 2976)

After a brief review of the structure and functions of the federal government, this course concerns itself with special areas of federal government: problems of national defense, the government as a promoter, the government as regulator, etc. Students will engage in in-depth study in one of the specific areas under consideration.

- 641. State Government.** Credit 3(3-0)
(Formerly Pol. Sc. 2977)

An in-depth study of special problems connected with operations of state and local governments.

- 642. Modern Political Theory.** Credit 3(3-0)
(Formerly Pol. Sc. 5973)

Includes selected political works for adherence to modern conceptions of the state, political institutions as well as the works of Machiavelli, Hobbes, Spinoza, Rousseau, Burke, Mill, Hegel, Marx, and Dewey.

- 643. Urban Politics and Government.** Credit 3(3-0)
(Formerly Pol. Sc. 5975)

A detailed analysis of the urban political arena including political machinery, economic forces and political structures of local governmental units.

- 645. American Foreign Policy—1945 to present.** Credit 3(3-0)
(Formerly Pol. Sc. 2976)

Examination of forces and policies that have emerged from Potsdam, Yalta, and World War II. Emphasis will be on understanding the policies that were formulated, why they were formulated, the consequences of their formulation, and the alternative policies that may have come about. Prerequisites: Survey course in American history, American Diplomatic History, and consent of instructor.

- 646. The Politics of Developing Nations.** Credit 3(3-0)
(Formerly Pol. Sc. 5974)

Political structures and administrative practices of selected countries in economic variable peculiar to the nations.

Courses For Graduates Only

For descriptions see Bulletin of the Graduate School.

- 730. Constitutional Development Since 1865.**
(Formerly Pol. Sc. 2896)

- 740. Government Finance.**
(Formerly Pol. Sc. 2898)

- 741. Comparative Government.**
(Formerly Pol. Sc. 2899)

- 742. Research and Current Problems.**
(Formerly Pol. Sc. 2980)

- 743. Readings in Political Science.**
(Formerly Pol. Sc. 5985)

Pre-Law Students

Students often ask, what course of study is best if one desires to enter law school upon graduation. The University of Denver Bulletin, College of Law, makes the following comment:

"In the College of Law, as in most law school, there is no course of study prescribed to precede admission to the study of law. A desirable prelegal course is one which prepares the student to think analytically, to reason logically, to concentrate effectively, to study purposefully and to express himself clearly in writing and speaking. In general, the prelaw student should acquire a broad liberal education. So far as possible, choice of courses should be made in accordance with the individual student's interests and needs. However, the student is strongly urged to obtain a broad background in the English language, including reading, writing and speaking."

DEPARTMENT OF SOCIOLOGY AND SOCIAL SERVICE

WILL B. SCOTT, *Chairman*

The Department of Sociology and Social Service offers curricula leading to the following:

1. a B.S. degree in Sociology
2. a B.S. degree in Social Service
3. a minor in Sociology
4. a minor in Social Service

It is assumed that students who select a major in sociology do so with the understanding that the program prepares only for graduate study in sociology.

The program in Social Service is designed to prepare students for professional careers in the social services, including immediate employment, and preparation for graduate study.

SOCIOLOGY

The B.S. degree curriculum in sociology is intended to prepare students for graduate study in sociology and to encourage graduates to select careers in college TEACHING and/or RESEARCH. It is not designed to prepare students for immediate employment in direct service giving occupations. Beginning in September 1971, sociology majors should select cognate areas in The School of Arts and Sciences; or obtain special written permission from the chairman for the selection of cognate areas in other Schools. A cognate area consists of twelve (12) credits. With its emphasis on preparation for graduate study, sociology majors must achieve and maintain a level of competency appropriate for graduate school admission. It should be noted that THERE ARE NO EMPLOYMENT OPPORTUNITIES AS SOCIOLOGISTS FOR HOLDERS OF BACHELOR DEGREES IN SOCIOLOGY.

A minor, consisting of 13-16 core courses in sociology, is available and open to all students in the University.

REQUIREMENTS FOR SOCIOLOGY MAJORS

Biology and/or Zoology	8 credits
Cognate area (12 credits in any one department in the School of Arts and Sciences)	12 credits
English 100, 101	8 credits
English electives	5 credits
Foreign Language	12 credits
Health Education or Physical Education	2 credits
Humanities 200, 201	6 credits
Math 111, 113, 240	11 credits
Philosophy or Political Science	6 credits
Sociology 100, 302, 204, 402, 303, 403, 671	19 credits
Sociology electives	11 credits
Speech	2 credits
World Civilization	6 credits
Free electives (to total 124 credits)	13 credits

During the FRESHMAN and SOPHOMORE years, the following courses should be completed:

Biology and/or Zoology	8 credits
English 100, 101	8 credits
English electives	5 credits
Foreign Language	6 credits
Health or Physical Education	2 credits
Humanities 200, 201	6 credits
Math 111, 113	8 credits
Philosophy or Political Science	6 credits
Sociology 100, 302, 204	9 credits
World Civilization (History—100 level course)	6 credits
	—
	64 credits

During the JUNIOR and SENIOR years, the following courses should be completed:

Cognate area	12 credits
Foreign Language	6 credits
Math 240	3 credits
Sociology 402, 403, 303, 671 (&)	13 credits
Sociology electives (&)	11 credits
Speech	2 credits
Free electives (to total 124 credits)	13 credits
	—
	60 credits

TOTAL 124 Credits

SOCIAL SERVICE

The B.S. degree curriculum in Social Service is designed to prepare students for professional careers in social services, including preparation for immediate employment and preparation for graduate study. The curriculum utilizes class and field instruction to develop and strengthen the attitudes, values, skills and knowledge essential for alleviating problems that impair the social functioning of individuals, groups, and communities.

In addition to the formal requirements of the program in Social Service, students are expected to demonstrate their interest and concern in social matters via active voluntary participation in on-campus and off-campus activities, groups, agencies, and organizations related to human social services.

REQUIREMENTS FOR SOCIAL SERVICE MAJORS

American History	6 credits
Biology and/or Zoology	8 credits
Economics	6 credits
English	13 credits
Foreign Language	6 credits
Health or Physical Education	2 credits
Humanities	6 credits
Math	10-13 credits
Political Science	6 credits
Social Service	17 credits
Sociology	16-19 credits
Speech	2 credits
Typing	2 credits
World Civilization	6 credits
Free electives (to total 124 credits)	15 credits

During the FRESHMAN and SOPHOMORE years, the following courses should be completed:

American History (any course)	3 credits
Biology or Zoology (any two courses)	8 credits
Economics (any two courses)	6 credits
English 100, 101	8 credits
Foreign Language	6 credits
Health or Physical Education	2 credits
Math 101, 102, 111	10 credits
Social Service 333	3 credits
Sociology 100, 302, 204	9 credits
Speech	2 credits
Typing	2 credits
World Civilization	6 credits
	—
	65 credits

During the JUNIOR and SENIOR years, the following courses should be completed:

American History	3 credits
English (any courses)	5 credits
Humanities 200, 201	6 credits
Math 240 or Sociology 671	3 credits
Political Science (any courses)	6 credits
Social Service 306, 307, 334	11 credits
Social Service (any course)	3 credits
Sociology 402, 403	7 credits
Free electives (to total 124 credits)	15 credits
	—
	59 credits

TOTAL 124 credits

- 200. Introduction to Anthropology.** Credit 3
An analysis and comparison of primitive cultures; further comparisons with modern cultures.
- 202. Sophomore Honors Seminar in Social Institutions.** Credit 3
(Formerly 300)
An examination of social institutions as major components of culture. Prerequisite: "B" average; restricted to sophomores. (May be used in place of Sociology 204.)
- 204. Social Problems.** Credit 3
Major social problems in American society and their relationship to social structure. Prerequisite: S. 100; concurrent S 302.
- 301. Origins of Social Thought.** Credit 3
(Formerly 401)
The nature of social thought from the Greeks to the 19th century.
- 302. Social Statistics I.** Credit 3
An introduction to elementary statistical reasoning. Prerequisite or concurrent: S. 100 or S. 204.
- 303. Social Statistics II.** Credit 3
Prerequisite: S. 302
- 304. Courtship and Marriage.** Credit 2
American premarital behavior patterns; emphasis on heterosexual relationships and preparation for marriage.
- 305. Reading for Honors in Sociology.** Credit 3
Intensive and extensive library research on topics in sociology. Prerequisite: "B" average.
- 308. The Family.** Credit 3
(Formerly 407)
The family as a social institution, and family types in cross cultural perspective.
- 313. The Community.** Credit 3
A study of the social boundaries commonly defined as communities and analysis of the social processes that occur within these boundaries.
- 402. Social Theories.** Credit 4
Social thought and theory in its development from Comte to the present. Prerequisite: S 302.
- 403. Social Research Methods.** Credit 3
Techniques used in social research. Prerequisite or concurrent: S. 402.
- 405. The Sociology of Work and Occupations.** Credit 3
(Formerly 500)
An analysis of work and occupational roles within bureaucratic societies. Forms of management-employee relations are studied.
- 406. Criminology.** Credit 3
Genesis and origin of crime; and an analysis of theories of criminal behavior. Prerequisite: 6 hours of Sociology or Social Service.

408. Independent Study I. Credit 3

Independent research on a specific topic or a delineated area in sociology. Prerequisite: permission of instructor. (May be used in place of Sociology 403.)

501. Social Stratification. Credit 3

A study of social inequalities and differentiation as related to social structures and social systems. Prerequisite: S. 302.

505. Seminar in Urban Studies Credit 3
(Formerly 600)

An analysis of the nature and problems of cities, urban society and urban development. Prerequisite: Junior standing.

COURSES IN SOCIAL SERVICE

133. Social Professions, Fields and Services. Credit 2

A basic introduction to selected social welfare professions, their histories, development and present practices, as related to education, training and service functions. Prerequisite: Permission of instructor.

306. Social Functioning and Human Development. Credit 3
(Formerly 421)

Selected aspects of social responses to growth, health, disease and disability. (majors and minors only.) Prerequisite: SS. 133 or SS. 333; concurrent: SS. 307, SS. 334.

307. Field Instruction I. Credit 5
(Formerly 424)

Supervised learning experiences in selected social agencies and settings. Concurrent: SS. 306, SS. 334.

318. Practicum in Community. Credit 3

Selection of a community problem. Study and analysis of the problem followed by corrective activities, when possible. Prerequisite: consent of instructor.

320. Reading for Honors in Social Welfare. Credit 3

Extensive library research in selected areas of social welfare. Prerequisite: Sophomore standing, "B" average.

325. Honors Seminar in Social Service. Credit 3

Selected topics in social welfare are extensively studied and discussed. (Majors and minors only). Prerequisite: "B" average, Junior standing.

333. Social Welfare I. Credit 3

Social Welfare legislation and policy.

334. Social Service Methods. Credit 3

Basic methods in the provision of social services. Concurrent: SS. 306, SS. 307.

425. Field Instruction II. Credit 3

Prerequisite: Consent of instructor.

520. Field Instruction III. Credit 5

Prerequisite: Consent of instructor. Concurrent: SS. 571.

- 525. Independent Study.** Credit 3
(Formerly 620)

Independent research in a delineated area of social welfare. Prerequisite: Consent of instructor.

- 571. Advanced Social Service Methods.** Credit 2

In depth discussion and utilization of selected social work methodology. Prerequisite: SS. 306, SS. 307, SS. 334, or equivalent; concurrent: SS. 520.

INTRA-DEPARTMENTAL COURSES

(These courses offer credit in either Sociology, or Social Service)

- 314. Black Experiences.** Credit 2

A topical seminar focusing on commonly shared experiences of American Blacks in selected social institutions. Prerequisite: Junior standing.

- 370. Aging in Society.** Credit 3

Ageing and its implications in social institutions. Prerequisite: Junior Standing.

- 515. Independent Study II.** Credit 3
(Formerly 601)

Prerequisite: 6 hours of statistics, and/or research.

- 570. Senior Seminar.** Credit 1

Research and discussion of professional, and field issues related to careers in Sociology and in Social Service. Prerequisite: Senior Standing.

- 669. Small Groups.** Credit 3

Elements and characteristics of small group behavior and process. Prerequisite: Senior or graduate standing; permission of instructor.

- 670. Law and Society.** Credit 2

This course examines selected and representative forms of social justice and injustices; barriers and opportunities for legal redress, as related to contemporary issues. Prerequisite: Senior or graduate standing.

- 671. Advanced Research Methods** Credit 3

Continuation of S. 403. Prerequisite: Senior or graduate standing; minimum of 6-9 credits in statistics and/or research.

SCHOOL OF BUSINESS



SCHOOL OF BUSINESS

HERBERT N. WATKINS, *Dean*

PURPOSE

The purpose of the School of Business is to develop business leaders who are capable of coping with new technologies and social progress. The scope of the School's programs includes curricula based primarily upon key concepts and skills necessary for decision-making and problem-solving roles in government, business, education, and industry. The School of Business also serves to perpetuate general understanding and appreciation for the interrelationships of the national as well as world socio-economic environments.

The programs within the School of Business are divided into three parts, viz., general education, business and economics core, and selected areas of specialization (accounting, business administration, business education, or office administration). Approximately forty per cent consists of courses designed to give a broad foundation in general education. Another forty per cent consists of courses designed to give the student a comprehensive background in basic areas of business and economics. Approximately twenty per cent is designed for specialization.

Admission Requirements of the School of Business

Graduates of standard high schools, and other students who are able to satisfy the entrance requirements of the University, may be admitted to the School of Business.

Degrees Offered

The School of Business offers the Bachelor of Science degree in the following areas: Accounting, Business Administration, Business Education, and Office Administration.

Degree Requirements

The individual student is held responsible for the election of his courses in conformity with the curriculum of his choice.

A student is required to graduate under the curriculum of his choice as announced in the catalogue current when he enters the School of Business as a resident student. A student is also subject to subsequent regulations published while he is a student.

A student who enters the School of Business has the privilege of graduating under the provisions of the catalogue under which he enters the University provided he completes his course within six years. After the interval of six years he is expected to conform to the catalogue requirements specified for the class with which he is graduated.

All candidates for the Bachelor of Science degree must take the Undergraduate Record Examination and/or the National Teachers Examination as a requirement of graduation.

The applicant for graduation must have earned a minimum of 124 semester hours excluding deficiency courses and remedial work with a cumulative grade point average of 2.00 or better on all courses undertaken and attain a cumulative grade point average of 2.00 or better in his major field of study.

Proficiency Examinations

Students who have had some training or experience in certain fields offered in the School of Business will be given an opportunity to take an examination in such fields with the permission of the Chairman of the Department and the approval of the Dean of the School of Business. A student who passes a proficiency examination is given credit toward graduation, provided that the course is acceptable in his curriculum. Credit is given only if a grade of "C" is made on the examination. "S" is the grade recorded on the student's record. No official record is made of failures in these examinations.

Proficiency examinations are given under the following restrictions:

1. They may be taken only by persons who are in residence in the University.
2. They may not be taken to raise grades or remove failures in courses.
3. They may be taken only once in the same course.

DEPARTMENT OF ACCOUNTING

HERBERT N. WATKINS, *Chairman*

ACCOUNTING CURRICULUM

Successful practice of accounting today requires both technical competence in accounting and a thorough understanding of the economic environment in which accounting operates. Only by understanding the objectives and constraints of the economic environment is the accountant able to apply his technical competence toward the solution of business problems.

The accounting curriculum attempts to meet this two-fold need by requiring broad exposure to the related business disciplines as well as rigorous training in the methodology and underlying theory of the specialized fields of accounting. Successful completion of the degree requirements will prepare a student for graduate study as well as accounting positions in business and government. Special attention is given to preparation for the C.P.A. examination.

Freshman Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
English 100, 101.....	3	3
Mathematics 111, 112	4	4
Biology 100, Physical Science 100, or Botany 740, Zoology 160	4	4
Business Administration 204	3	
Accounting 221.....		3
History 100		3
	<hr/> 14	<hr/> 17

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Accounting 222.....	3	
Business Administration 305	3	
Psychology 320.....		3
Accounting 441.....		3
Business Administration 450	3	
Economics 301, 302.....	3	3
Humanities 200.....		3
Physical Education or Health Education	1	1
History 101	3	(2)
Speech 250		2
	<hr/> 16-15	<hr/> 15-16

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Mathematics 224.....	3	
Business Administration 451, 452	3	3
Business Administration 449		3
Business Administration 572		3
Accounting 444.....	3	
Accounting 445.....	3	
Accounting 545.....		3
Accounting 443.....		3
Humanities 201.....	3	
	<hr/> 15	<hr/> 15

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Business Administration 440		3
Accounting 561.....	3	
Accounting 562.....	3	
Accounting 590.....		3
Business Administration 578	3	
Business Administration 459		3
Business Administration 454	3	
Electives.....	3	6
	<hr/> 15	<hr/> 15

Major Program Requirements:

	Semester Hours
Acct. 441—Intermediate Accounting	3
Acct. 443—Income Tax Accounting	3
Acct. 444—Cost Accounting	3
Acct. 445—Advanced Accounting I	3
Acct. 545—Advanced Accounting II	3
Acct. 561—Auditing Principles	3
Acct. 562—Accounting Systems	3
Acct. 590—Seminar in Accounting Theory	3
B.A. 449—Business Statistics	3
B.A. 452—Principles of Business Law II	3
	<hr/> 30

COURSES IN ACCOUNTING**Undergraduate**

- 221. Principles of Accounting I.** Credit 3(3-1)
(Formerly Accounting 3321)

Introduction to the basic records and procedures used by service and merchandising organizations in accumulating financial data with emphasis on statement presentation. Includes discussion of special problems of income measurement and asset valuation. Prerequisite: B.A. 204.

- 222. Principles of Accounting II.** Credit 3(3-1)
(Formerly Accounting 3322)

Continuation of Principles of Accounting I. Emphasis on financial statement interpretation and uses of accounting data by management for planning and control. Prerequisite: Acct. 221.

- 441. Intermediate Accounting.** Credit 3(3-1)
(Formerly Accounting 3341)

Rigorous study of the methodology and underlying theory of financial accounting. In-depth analysis of valuation alternatives, problems, and their effect on the income measurement. Prerequisite: Acct. 222.

- 443. Income Tax Accounting.** Credit 3(3-1)
(Formerly Accounting 3343)

Study of current Federal Income Tax law as they apply to individuals, partnerships, fiduciaries, and corporations. Prerequisite: Acct. 222.

- 444. Cost Accounting.** Credit 3(3-1)
(Formerly Accounting 3344)

Study of the principles and methodology of inventory cost determination and its effect on income measurement for manufacturing concerns, including product, process, and standard cost systems. Special attention given to uses of accounting data as an aid in managerial planning and control. Prerequisite: Acct. 441.

- 445. Advanced Accounting I.** Credit 3(3-1)
(Formerly Accounting 3342)

Advanced financial accounting applied to partnerships, installment sales, consign-

ments, fiduciaries and other specialized situations. Fundamentals of actuarial science. Prerequisite: Acct. 441.

446. Managerial Accounting. Credit 3(3-1)

Development of accounting concepts and techniques as aids to management, planning and control; including budgeting, cost behavior, cost-volume-profit analysis, and responsibility accounting. Prerequisite: Acct. 222.

545. Advanced Accounting II. Credit 3(3-1)

Branches and agencies; mergers and consolidations; parent and subsidiaries; pooling of interests vs. purchases; foreign exchange; fund accounting; and special advanced topics. Prerequisite: 441.

561. Auditing Principles. Credit 3(3-1)
(Formerly Accounting 3361)

Concentrates on the conceptual and practical aspects of the examination of financial statements by independent accountants, including discussion of public accounting as a profession. Prerequisite: Acct. 441.

562. Accounting Systems. Credit 3(3-1)
(Formerly Accounting 3362)

Focuses on current techniques of data processing with emphasis on principles of internal control. Prerequisite: Acct. 441.

590. Seminar in Accounting Theory. Credit 3(3-1)

The framework of ideas, concepts, and principles which make up the body of knowledge of accounting theory. Prerequisite: Senior standing.

DEPARTMENT OF BUSINESS ADMINISTRATION

ALBERT D. SMART, *Chairman*

BUSINESS ADMINISTRATION CURRICULUM

Students who possess ability and interest in some phases of business administration but who may not yet desire to specialize usually elect business administration as a major. This curriculum comprises sufficient courses for a basic background in several areas, including accounting, finance, management, quantitative analysis, marketing, and legal environment. The principal aim of this program is twofold: terminal and preparatory.

First, this curriculum offers adequate training in business administration to enable the major to secure responsible positions in business or government. The second aim of this curriculum is to equip the major with adequate background for graduate school. Thus, for the growing number of students who desire to pursue graduate studies in business administration, this program provides ample flexibility and rigor.

Freshman Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
English 100, 101.....	3	3
Mathematics 111, 112.....	4	4
Biology 100, Physical Science 100 or Botany 140, Zoology 160	4	4
History 100.....	3	—
Business Administration 204	—	3
	<hr/> 14	<hr/> 14

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Accounting 221, 222	3	3
Humanities 200, 201	3	3
Economics 301, 302.....	3	3
History 101	3	—
Health Education 200 or.....	—	2
Physical Education	1	1
Business Administration 305	3	—
Mathematics 224.....	—	3
Speech 250	—	2
	<hr/> 16-15	<hr/> 15-16

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Accounting 446.....	3	—
Business Administration 451, 452	3	3
Business Administration 440	3	—
Business Administration 450	—	3
Business Administration 449	3	—
Business Administration 458	—	3
Business Administration 454	—	3
Business Administration 459	—	3
Psychology 320.....	3	—
	<hr/> 15	<hr/> 15

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Business Administration 564	—	3
Business Administration 457	3	—
Business Administration 569, 570	3	3
Business Administration 571, 572	3	3
Business Administration 578	3	—
Electives.....	5	7
	<hr/> 17	<hr/> 16

Major Program Requirements:

	Semester Hours
Accounting 446.....	3
Business Administration 449.....	3
Business Administration 457.....	3
Business Administration 459.....	3
Business Administration 564.....	3
Business Administration 569.....	3
Business Administration 570.....	3
Business Administration 571.....	3
Business Administration 572.....	3
Business Administration 578.....	3
	<hr/>
	30

COURSES IN BUSINESS ADMINISTRATION

Undergraduate

- 204. Introduction to Business.** Credit 3(3-0)
(Formerly Business Administration 3304)
Designed to acquaint the student with the various specialized areas in business. An entry level course.
- 305. Principles of Management.** Credit 3(3-0)
(Formerly Business Administration 3325)
Treats the principles underlying organization and management of business enterprises. Prerequisite: Business Administration 204.
- 440. Principles of Marketing.** Credit 3(3-0)
(Formerly Business Administration 3340)
An examination of fundamental principles, methods, and problems of marketing. Prerequisite: Business Administration 204.
- 449. Business Statistics.** Credit 3(3-0)
(Formerly Business Administration 3349, Advanced Business Statistics)
Treats probability, binomial distributions, problems of sampling, index numbers, time series, trend fitting, correlation, testing of hypotheses. Prerequisite: Mathematics 224.
- 450. Business Communication.** Credit 3(3-0)
(Formerly Business Administration 3350)
Designed to improve written communication in business. Stresses effective communication via letters, memorandums, informal and formal reports. Prerequisite: English 101.
- 451. Principles of Business Law I.** Credit 3(3-0)
(Formerly Business Administration 3351)
Treats law of contracts, agency, negotiable instruments, property, partnership, corporations.

- 452. Principles of Business Law II.** Credit 3(3-0)
(Formerly Business Administration 3352)

A rigorous treatment of the fundamentals of life insurance. Prerequisite: Business Administration 454. A continuation of Business Administration 451.

- 454. Principles of Insurance.** Credit 3(3-0)
(Formerly Business Administration 3354)

Treats the principal types of insurance including life, property, and Marine. Prerequisite: Business Administration 451.

- 456. Property Insurance.** Credit 3(3-0)
(Formerly Business Administration 3356)

Examines the theory and principal contracts of property insurance. Prerequisite: Business Administration 454.

- 457. Principles of Real Estate.** Credit 3(3-0)
(Formerly Business Administration 3357)

Analyzes the fundamental laws of real property with special emphasis on the changing character of the urban economy; buildings and land uses and their values. Prerequisites: Economics 301, 302; Business Administration 451.

- 458. Principles of Advertising.** Credit 3(3-0)
(Formerly Business Administration 3358)

Analyzes the fundamentals of advertising, including various advertising media. Prerequisite: Business Administration 440.

- 459. Money, Credit and Banking.** Credit 3(3-0)
(Formerly Business Administration 3359)

Treats the principles and functions money serves in the economy. Emphasis is placed on bank organization and operation of the Federal Reserve System. Prerequisites: Economics 301, 302.

- 470. Urban Transportation Concepts.** Credit 3(3-0)

An analysis of the role of transportation in the urban scene. Topics cover transportation needs of the poor, demand for the modes of transportation, and urban transportation planning methods. Prerequisite: Sophomore classification.

- 560. Health Insurance.** Credit 3(3-0)
(Formerly Business Administration 3360)

Deals with the principles, problems and types of coverages encompassing health and disability insurance. Prerequisite: Business Administration 454.

- 564. Seminar in Business.** Credit 3(3-0)
(Formerly Business Administration 3364, Seminar in Management)

Explores problems encountered in both the organizational and operative aspects of business enterprises. Prerequisite: Senior classification.

- 565. Principles of Salesmanship.** Credit 3(3-0)
(Formerly Business Administration 3365)

Treats the fundamentals of planning, acquiring resources, organizing, and operating a sales organization. Prerequisite: Business Administration 440.

- 566. Social Insurance.** Credit 3(3-0)
(Formerly Business Administration 3366)

An analysis of the various programs in existence for purposes of economic and social security. Prerequisite: Business Administration 454.

- 567. Business Insurance.** Credit 3(3-0)
(Formerly Business Administration 3367)
Treats various types of insurance protection available to business enterprises. Prerequisite: Business Administration 454.
- 568. Office Organization and Management.** Credit 3(3-0)
(Formerly Business Administration 3368)
Treats principles and concepts of scientific office management and the responsibility of management of office services. Prerequisite: Business Administration 305.
- 569. Personnel Organization and Management.** Credit 3(3-0)
(Formerly Business Administration 3369)
Deals with problems involved in organizing, staffing, and maintaining a formal business organization. Prerequisite: Business Administration 305.
- 570. Principles of Retailing.** Credit 3(3-0)
(Formerly Business Administration 3370)
Examines the principles and practices of retailing consumer goods and services, including organization and management. Prerequisite: Business Administration 440.
- 571. Principles of Investment.** Credit 3(3-0)
(Formerly Business Administration 3371)
Analyzes the various types of corporate and public securities; examines the operation of securities markets. Prerequisite: Accounting 222.
- 572. Electronic Data Processing for Business.** Credit 3(3-0)
Introduction to electronic information systems, including the operation and programming of electronic digital computers. Prerequisites: Mathematics 101 and 102 or 111.
- 575. Business Administration Internship.** Credit 2(1-2)
Formerly Business Administration 3375)
A program designed to permit the student to obtain practical business training in selected businesses and offices under "real world" conditions. Prerequisite: Senior classification.
- 578. Corporate Finance.** Credit 3(3-0)
(Formerly Business Administration 3378)
Analyzes problems financial management faces in raising and controlling funds for the business enterprise. Prerequisite: Accounting 222.
- 579. Personal Finance.** Credit 3(3-0)
(Formerly Business Administration 3379)
Treats the problems faced by individuals in managing personal incomes and expenditures. Stress is also placed upon credit, borrowing, and saving. Prerequisite: Economics 301.

For Advanced Undergraduates and Graduates

- 601. Government and Business.** Credit 3(3-0)
(Formerly Business Administration 3381)
Treats government policies and practices affecting business enterprises. Prerequisite: Senior or graduate student.
- 602. International Trade.** Credit 3(3-0)
(Formerly Business Administration 3382)
Analysis of political and economic policies and practices relevant to international

marketing. Debates which emanate from trade between countries are researched and evaluated. Prerequisite: Senior or graduate student.

610. Interdisciplinary Seminar in Urban Transportation. Credit 1-3(3-0)

Geared to current developments in urban transportation; an interdisciplinary course on urbanism and transportation. Prerequisite: Advanced status in business administration, business education, accounting, economics, political science, sociology, or architectural engineering.

DEPARTMENT OF BUSINESS EDUCATION

FLORENTINE V. GOODLETT SOWELL, *Chairman*

COMPREHENSIVE BUSINESS EDUCATION CURRICULUM

The comprehensive business education curriculum is designed to develop students to teach both skill and basic business subjects at the secondary school level. The curriculum meets the certification requirements for the State of North Carolina. Nevertheless, each student must make the minimum score on the National Teachers Examination as required by the State of North Carolina to qualify for a Class A North Carolina teaching certificate.

Freshman Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
English 100, 101.....	3	3
Mathematics 101, 102	3	3
*Biology 100, Physical Science 100, Botany 140, Zoology 160	4	4
*(Select any two)		
Business Administration 204	—	3
Business Education 301, 302	2	2
Education 100.....	1	—
History 100, 101.....	3	3
	—	—
	16	18

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Accounting 221, 222	3	3
Humanities 200, 201	3	3
Business Education 331, 332	3	3
English 250	—	2
Business Education 334.....	2	—
Business Education 336.....	—	3
Education 300, 301	2	2
Health Education 200	2	—
Physical Education	1	1
	—	—
	16	17

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Business Administration 451	3	—
Business Administration 305	—	3
Business Education 447.....	3	—
Business Education 576.....	—	3
Education 400.....	3	—
Business Administration 572	—	3
Mathematics 115.....	3	—
Mathematics 224.....	—	3
Economics 301, 302.....	3	3
Business Education 336.....	3	—
Business Administration 440	—	3
	—	—
	18	18

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Business Administration 450	(3)	3
Education 560.....	6	(6)
Education 500.....	3	(3)
Business Education 573.....	3	(3)
**Business Education 574	(0)	0
Business Administration 578	(3)	3
Business Administration 579	(3)	3
Elective	(2)	2
	—	—
	12 (11)	11 (12)

Major Programs Requirements:

	Semester Hours
B.A. 305—Principles of Management.....	3
B.A. 440—Principles of Marketing	3
B.A. 450—Business Communication	3
B.A. 578—Business Finance	3
B.A. 572—Electronic Data Processing for Business.....	3
B.E. 331, 332—Shorthand I, II.....	6
B.E. 447—Transcription I.....	3
B.E. 573—Office Procedures.....	3
B.A. 579—Personal Finance	3
	—
	30

** NOTE: Students majoring in comprehensive business education are required to have had some office experienced—six montes to one year. Students will be given an "S" graee upon submitting letters signifying their business work experience from a qualified immediate supnrvisor in a firm or professional office.

BASIC BUSINESS EDUCATION CURRICULUM

The basic business education curriculum is designed to develop students to teach basic business subjects at the secondary school level. The curriculum meets the certification requirements for the State of North Carolina. Nevertheless, each student must make the minimum score on the National Teachers Examination as required by the State of North Carolina to qualify for a Class A North Carolina teaching certificate.

Freshman Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
English 100, 101.....	3	3
Mathematics 101, 102	3	3
*Biology 100, Physical Science 100, Botany 140, Zoology 160	4	4
*(Select any two)		
Business Administration 204	—	3
Business Education 301, 302	2	2
Education 100.....	1	—
History 100, 101.....	3	3
	<u>16</u>	<u>18</u>

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Accounting 221, 222	3	3
Humanities 200, 201	3	3
Business Administration 305	3	—
Psychology 320.....	—	3
Education 300, 301	2	2
Business Education 334.....	—	2
English 250	2	—
Health Education 200	2	—
Physical Education	1	1
	<u>16</u>	<u>14</u>

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Accounting 446.....	3	—
Business Administration 451, 452	3	3
Business Administration 440	3	—
Economics 301, 302.....	3	3
Education 400.....	3	—
Business Education 577.....	—	3
Mathematics 115.....	—	3
Mathematics 224.....	3	—
Business Education 336.....	3	—
Business Administration 572	—	3
	<u>18</u>	<u>18</u>

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Business Education 573.....	3	(3)
Education 500.....	3	(3)
Education 560.....	6	(6)
Business Administration 450	(3)	3
Business Administration 578	(3)	3
Business Administration 579	(3)	3
**Business Education 574	(0)	0
Elective (non-business)	(2)	2
	<hr/> 12 (11)	<hr/> 11 (12)

Major Program Requirements:

	Semester Hours
Acct. 446—Managerial Accounting.....	3
B.A. 305—Principles of Management.....	3
B.A. 440—Principles of Marketing	3
B.A. 451, 452—Principles of Business Law I, II.....	6
Math. 224—Elementary Statistics	3
B.A. 572—Electronic Data Processing for Business.....	3
B.A. 450—Business Communication	3
B.A. 578—Business Finance	3
B.A. 579—Personal Finance	3
	<hr/> 30

REQUIREMENTS FOR STUDENTS TEACHING IN BUSINESS EDUCATION

To be eligible for student teaching in both comprehensive business education and basic business education, the student must have met the following requirements:

1. Senior standing.
2. Completed three-fourths of the number of hours required in the basic business and economics courses.
3. Completed three-fourths of the number of hours required in his subject matter major.
4. Attained an average of 2.00 or better on all work undertaken in the University, on all professional education courses undertaken and on all courses undertaken in the subject matter major.
5. Possess a personality deemed necessary for successful teaching.

** NOTE: Students majoring in basic business education are required to have had some office experience—six months to one year. Students will be given an "S" grade upon submitting letters signifying their business work experience from a qualified immediate supervisor in a firm or professional office.

OFFICE ADMINISTRATION CURRICULUM

The office administration curriculum is designed to develop personnel for managerial-level service roles as office executives and secretaries in business, professional, governmental, and industrial firms.

Freshman Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
English 100, 101.....	3	3
Mathematics 101, 102	3	3
*Biology 100, Physical Science 100,		
Botany 140, Zoology 160	4	4
*(Select any two)		
Business Education 301, 302	3	3
Business Administration 204	—	3
History 100, 101.....	3	3
	—	—
	16	18

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Accounting 221, 222	3	3
Humanities 200, 201	3	3
English 250	2	—
Psychology 320.....	—	3
Business Education 331, 332	3	3
Business Education 334.....	2	—
Mathematics 115.....	—	3
Physical Education	1	1
	—	—
	14	16

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Business Administration 451, 452	3	3
Business Administration 440	—	3
Business Administration 305	—	3
Business Education 447.....	3	—
Economics 301, 302.....	3	3
Health Education 200	2	—
Mathematics 224.....	—	3
Business Administration 572	3	—
	—	—
	14	15

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Business Administration 450	3	—
Business Administration 459	—	3
Business Administration 568	3	—
Business Administration 569	—	3
Business Administration 578	3	—
Business Administration 579	—	3
Business Education 573.....	3	—
**Business Education 574	0	0
Electives.....	3	5
	15	14

Major Program Requirements:

	Semester Hour
B.A. 568—Office Organization and Management.....	3
B.A. 572—Electronic Data Processing for Business.....	3
B.E. 331, 332—Gregg Shorthand I, II.....	6
B.E. 447—Transcription I	3
B.A. 305—Principles of Management.....	3
B.A. 569—Personnel Management	3
B.A. 450—Business Communication	3
B.E. 573—Office Procedures.....	3
B.A. 579—Personal Finance	3
	30

COURSES IN BUSINESS EDUCATION**Undergraduate**

- 301. Typewriting I.** Credit 2(0-5)
(Formerly Office Administration 3301)

Designed to develop a working knowledge of the use of the typewriter toward final mastery of keyboard reaches with drills, simple problems, and techniques of control. Requirement: 45 gwam.

- 302. Typewriting II.** Credit 2(0-3)
(Formerly Office Administration 3302)

Emphasis on technical typewriting, tabulation reports, and other advanced practical applications. Requirement: 60 gwam. Prerequisite: Business Education 301.

** NOTE: Students majoring in office administration are required to have had some office experience—six months to one year. Students will be given an "S" grade upon submitting letters signifying their business work experience from a qualified immediate supervisor in a firm or professional office.

- 303. Typewriting III.** Credit 2(0-3)
(Formerly Office Administration 3303)

Emphasis on intensive skill building, development of job competencies, office typing problems, fundamentals needed in office employment, Prerequisite: Business Education 302.

- 331. Gregg Shorthand I.** Credit 3(3-2)
(Formerly Office Administration 3331)

Study of theory as outlined in Gregg Shorthand Diamond Jubilee Series. Requirement: 70 wam on practiced matter. Prerequisite: Business Education 302.

- 332. Gregg Shorthand II.** Credit 3(3-0)
(Formerly Office Administration 3332)

Emphasis is placed on difficult dictation and transcription, speed tests and reporting speeches. Requirement: 80 wam on new matter. Prerequisite: Business Education 302, 331.

- 334. Business Machines.** Credit 2(1-3)
(Formerly Office Administration 3334)

Designed to develop concepts and skill in the use of modern office equipment. Prerequisite: Business Education 302.

- 336. Measurement in Business Education.** Credit 3(3-0)

Study of instruments of measurement, construction and use of diagnostic, prognostic, remedial, and achievement evaluation in skill and basic business education subject matter.

- 447. Transcription I.** Credit 3(2-1)
(Formerly Office Administration 3347)

Designed to review techniques and coordinate the skills of typewriting, shorthand, and English and promote desirable habits of performance. Intensive development of secretarial skill through timed dictation. Requirement: The production of mailable transcripts. Prerequisite: Business Education 331, 332.

- 448. Transcription II.** Credit 3(2-1)
(Formerly Office Administration 3348)

Speed building emphasis and further development of skill to take dictation and transcribe at maximum rates to satisfy the requirements of business. Requirement: The production of mailable transcripts. Prerequisite: Business Education 447.

- 453. Principles of Business Education.** Credit 3(3-0)
(Formerly Business Education 3386)

Designed particularly for business teachers. Treats the meaning, purpose and scope of the business education program. Prerequisite or concurrent: Business Education 576 or 577. Available for undergraduate and in-service teachers.

- 573. Office Procedures.** Credit 3(2-1)
(Formerly Office Administration 3373)

Discuss the qualifications, duties and responsibilities of the secretary in the modern business office. Prerequisites: Business education 301, 302, and Business Education 331, 332.

574. Secretarial Internship.

Credit 0

(Formerly Office Administration 3374)

A field work program of observation and work in selected business firms. Designed to contribute materially to the total development of the student's educational experiences. Prerequisite: Senior standing.

576. Methods of Teaching Comprehensive Business Subjects.

Credit 3(5-0)

(Formerly Business Education 3376)

Analysis and evaluation of objectives, materials, and methods of teaching typewriting, shorthand, transcription, and related office skills. Provision is made for observation and participation in demonstration teaching. Prerequisite or concurrent: Education 500, Psychology 541.

577. Methods of Teaching Business Subjects.

Credit 3(5-0)

(Formerly Business Education 3377)

Selection, organization, and evaluation of supplementary teaching materials and analysis of techniques in teaching bookkeeping, general business, business law, business structure, and elementary economics. Construction of teaching units, enrichment materials, and lesson plans for effective teaching on the secondary level. Prerequisite or concurrent: Education 500, Psychology 541.

SCHOOL OF EDUCATION



SCHOOL OF EDUCATION

S. JOSEPH SHAW, *Dean*

The School of Education provides opportunities for students to prepare for teaching careers in the elementary (K-3) and secondary schools of the state and for other professional careers in industry and government. The programs of study are planned to allow the students to attain competence in both specialized and general areas of Education.

The School of Education includes the following departments: Education, Psychology and Guidance, and Health, Physical Education and Recreation. In addition to these departments the School includes the Division of Industrial Education and Technology, the Department of Adult Education and Community Services and the Reading Center.

All professional teacher education programs are administered and supervised by the School of Education. The Schools of Education and Graduate Studies cooperate with the graduate teacher education programs.

Upon the satisfactory completion of one of the undergraduate programs offered by the School of Education in cooperation with other departments of the University, the student is eligible to receive the degree of Bachelor of Science with a major in one of the following areas: Agricultural Education, Art Education, Biology Education, Business Education, Chemistry Education, English Education, French, History, Home Economics Education, Industrial Arts, Industrial Education, Mathematics Education, Music Education, Physical Education, Physics Education, Social Studies, Psychology, Recreation, and Library Science.

TEACHER EDUCATION

The program of teacher education seeks to improve the quality of education available to the youth of North Carolina through improved preparation of teachers and other school personnel including administrators, guidance counselors and supervisors. To that end, it offers both undergraduate and graduate programs of professional study which represent a continuum with similar objectives. The program seeks, therefore, to attain these goals:

- (1) Prepare young people to take their places as competent members of the profession of education; and
- (2) Provide opportunities for advanced study for school personnel already established in education.

The office of the Registrar in collaboration with the office of the Director of Teacher Education is the central agency vested with the authority and responsibility to certify to the State Department of Public Instruction students who are to be recommended by the Institution for certification in the following fields:

- | | |
|------------------------------|-------------------------------------|
| 1. Agricultural Education | 10. Home Economics Education |
| 2. Art | 11. Industrial Education |
| 3. Biology | 12. Mathematics |
| 4. Early Childhood Education | 13. Music |
| 5. Business Education | 14. Physical Education |
| 6. Chemistry | 15. Physics |
| 7. English | 16. Social Sciences |
| 8. Foreign Languages | 17. Vocational Industrial Education |
| 9. History | |

In recognition of this function, the approval or endorsement of the department providing courses in the subject matter areas in which the candidate is to be certified

must be secured prior to the approval or endorsement of the Director. The University reserves the right to refuse to recommend any applicants for certificates when they are deficient in mental or physical health, scholarship, character, or other qualifications deemed necessary for success in the profession of education.

The program in teacher education is divided into three separate but interrelated phases: (1) general education; (2) subject-matter or certification specialization; and (3) professional education.

General Education

The general education phase of the Teacher Education Program functions to provide experience and learning which meet the fundamental needs of all teachers, both in the role of teacher and citizen in a democracy. General education provides for the student the understandings, the knowledge, the appreciation, and the sensitivity attainable through the study of a broad range of materials and concepts ranging across the humanities, the arts, the social sciences, the natural sciences and mathematics. It provides a broad understanding of the cultural heritage and of the physical and social environments.

General education constitutes 40 percent of the four-year Teacher Education Program. It is recommended that the student complete the general education requirements by the end of the sophomore year.

The specific purposes of the program in general education are to:

1. Develop competency in the ability to read, write and speak the English language clearly and effectively.
2. Develop an understanding of the development of world civilization and understandings of the basic concepts of the social studies, and an understanding of democracy as a way of life.
3. Develop a critical understanding of and a sensitivity to the aesthetic, philosophical, ethical, and imaginative values expressed in literature, art, music, religion and philosophy.
4. Develop an appreciation and understanding of the structure of science, of scientific inquiry, and of the main scientific principles.
5. Develop an appreciation and understanding of the structure and applications of mathematics.
6. Develop the knowledge, habits, and attitudes necessary to achieve and maintain sound physical and mental health.

Transfers to the Teacher Education Program

Transfer policies refer to the student who starts his college program in an academic area (such as mathematics or chemistry) and decides to become a teacher late in his college career. The following requirements are necessary for admittance to the Teacher Education Program under these conditions:

1. The student must have satisfied the general education requirements.
2. The student must have a 2.00 grade point average in his academic work and the general education program.
3. The student must apply formally to be admitted to the Teacher Education Program. Application will be made to the Chairman of the Department in which he plans to major.

4. The student must meet the same criteria as are recommended for other students in Suggested Policies Governing Admission to the Teacher Education Program.
5. The Chairman of the Academic Department has the responsibility of enrolling the student in the Teacher Education Program after the student has met all requirements.

Certification

When the student completes the Teacher Education sequence, he must apply for state certification by (1) requesting a certification application form from the Registrar's office and (2) requesting a copy of his official transcript to be attached to the application and submitted to the Division of Certification.

The student must take the National Teacher Examination, both the Common and the Teaching Area Examinations, and he must have these scores on file in the Teacher Education Office.

Teacher Education Admission and Retention Standards

Admission

To be admitted to the Teacher Education Program a student should file an application with the chairman of the academic department in which he plans to major during his sophomore year. The student must have an overall grade point average of 2.00 and a major field average of 2.00 before he can be admitted to the Program.

Prior to his fourth semester in residence each applicant must satisfy the following requirements:

1. Successfully complete Mathematics 101 and 102 or 111.
2. Successfully complete English 100, 101, and 250 with a grade of "C" or better in each course.
3. Take a personality inventory test.
4. Show evidence of good health. A statement from a physician is necessary. The health of a prospective teacher should not restrict his ability as a teacher. The details regarding what constitutes health not good enough for a teacher will be determined in consultation with the Student Health Director.
5. Demonstrate his ability to use the English language effectively.

During the fourth semester of a student's residence, his complete profile will be examined by the Teacher Education Council. At this time, the student must have a minimum cumulative average of 2.00 before the Teacher Education Council will entertain his application for Teacher Education.

Retention

To remain in the Teacher Education Program, the student must:

Maintain an academic average of 2.00 in the areas in which he seeks certification and in professional education. In addition, a student must repeat any required major field course or professional education course, except Psychology 320 or Education 300, when he earns a grade of "D". The repetition will not be considered in the hours required for graduation but the hours and the grade for the repetition will be included in the determination of the overall grade point average.

- a. Should a student's academic average fall below 2.00 in either the area he seeks certification or the area of professional education, he will be placed on probation or dropped from the Teacher Education Programs, depending on the level to which his academic marks fall.
- b. Once a student has been dropped from the Teacher Education Program because of poor scholarship, he may reapply with the Director of Teacher Education providing his academic average has returned to 2.00 in the area he seeks certification and/or in the area of professional education.

Readmission to Teacher Education Program

Once a student has been dropped from the Teacher Education Program for any reason, the following steps must be taken before a student will be readmitted to the Teacher Education Program:

1. The student must file a formal application for readmittance to the Teacher Education Program with the Director of Teacher Education.
2. The Director of Teacher Education must bring the application of the student along with the student's complete profile before the Teacher Education Council for action.
3. The Director of Teacher Education will formally notify, in writing, the student, Department Chairman, Dean of the School involved and the Dean of Academic Affairs of the action of the Teacher Education Council with reference to the student's application for readmission to the Teacher Education Program.

DEPARTMENT OF EDUCATION

DOROTHY M. PRINCE, *Chairman*

The Department of Education offers a major in Early Childhood Education for prospective teachers of kindergarten through grade three, a program in Library Science, a program in Reading, and professional education for prospective secondary school teachers. In Library Science, a student may pursue the Teacher-Librarian Program or the School-Librarian Program. Two options are offered in Reading: (1) Early Childhood Education and Reading and (2) Secondary Education and Reading. The department also provides professional education and cooperates with the various academic departments of the University for the preparation of secondary school teachers.

Early Childhood Education

The Early Childhood Education program is designed to develop professional competencies and understandings needed to teach in kindergarten through grade 3. The program is interdisciplinary and requires a minimum of 124 semester credit hours. Satisfactory completion of the curriculum leads to the Bachelor of Science in Education degree with a major in Early Childhood Education and to North Carolina teacher certification in K-3.

The program aims to develop prospective teachers who will realize the importance of change and the need for continued learning. Specific objectives of the program are:

1. To produce socially sensitive teachers who understand and are willing to assume their responsibility to society.
2. To provide opportunities for prospective teachers to develop the ability to think critically, analytically, and creatively in dealing with the needs of learners.
3. To provide the prospective teacher with a broad experience in general education including the disciplines of the humanities, sciences, and social science.
4. To prepare competent teachers for grades K-3 through a strong interdisciplinary curriculum.
5. To provide for the knowledge and understanding of the learning process; human growth and development; sociological, historical, and philosophical foundations of American education.
6. To provide opportunities for professional laboratory experience and the application of instructional methodology, curriculum content, and utilization of organizational patterns in grades K-3.
7. To develop an understanding of the purpose, organization, and administration of school systems with emphasis on the role of the teacher in the total education program.

Suggested Sequence for Early Childhood Education

Freshman Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
English 100, 101.....	3	3
History 204, 205.....	3	3
Mathematics 111.....		4
Education 100.....	1	
Physical Science 100	4	
Health Education 200	2	
Physical Education 101, 102.....	1	1
Political Science 230		3
Geography 210.....		3
	<hr/>	<hr/>
Total	14	17

Sophomore Year

Psychology 320.....	3	
Child Development 413, 311	3	3
Zoology 160, 461	4	4
Speech 250	2	
Anthropology 200		3
Humanities 200, 201	3	3
Education 300, 301	2	2
Electives.....	3	
	<hr/>	<hr/>
Total	17	18

Junior Year

Education 451, 644	2	3
Music 609	3	
Art 600		3
Child Development 315		3
Psychology 436	3	
Education 660		3
Education 635		3
Physical Education 462	2	
English 220 or 430	3	
Electives	3	1
	<hr/>	<hr/>
Total	16	16

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Block I		
Child Development 519	6	
Food & Nutrition 437	3	
Electives	3	
Block II		
Education 556		3
Education 557		3
Education 558		6
	<hr/>	<hr/>
Total	12	12

Library Science

Library science education at the University is designed to qualify undergraduate students for North Carolina certification as teacher-librarians or school librarians at the elementary or secondary school level. The professional education program for the prospective teacher-librarian and the school-librarian is the program followed for the major teaching area. Student teaching includes full-time continuous laboratory experience in a school library. As a second area of preparation, the teacher-librarian program includes a minimum of 12 semester hours in library science courses and the school-librarian program requires a minimum of 18 semester hours.

Suggested Sequence for the Teacher-Librarian Program

Sophomore Year

	<i>Spring</i>	
Ed. 412		3
		<hr/>
		3

Junior Year

Ed. 413.....	3	Ed. 650 or 651	3
	<u>3</u>		<u>3</u>

Senior Year

Ed. 410.....	3
	<u>3</u>

Suggested Sequence for the School-Librarian Program**Sophomore Year**

Ed. 411.....	3	Ed. 412.....	3
	<u>3</u>		<u>3</u>

Junior Year

Ed. 413.....	3	Ed. 650 or 651	3
	<u>3</u>		<u>3</u>

Senior Year

Ed. 410.....	3	Ed. 415.....	3
	<u>3</u>		<u>3</u>

Reading

The Reading program prepares the Teacher of Reading. Undergraduate students who are Early Childhood Education majors and secondary school teaching majors may pursue Reading as a second area of concentration. The student must complete a minimum of eighteen semester hours of prescribed courses in the option that he selects.

OPTION A: EARLY CHILDHOOD EDUCATION AND READING

An Early Childhood Education major who selects Reading as a second area of concentration must complete Ed. 630, 635 or 636, 638, 639, 557 and Psychology 436. The student may also elect English 626 and other courses in Reading.

OPTION B: SECONDARY EDUCATION AND READING

A student majoring in any secondary subject area (English, speech, social studies, science, etc.) may pursue a second area of concentration in Reading. He must complete Ed. 630, 637, 638, 639, English 627 and Psychology 436. He may also elect English 510, 501; Speech 630, 610 and other courses in Reading.

PROFESSIONAL EDUCATION

The professional education phase of the program in teacher education is designed to discover the prospective teacher of promise and to develop the competencies necessary for beginning teachers at the secondary level.

Approximately eighteen percent of the undergraduate curriculum is devoted to professional education. This phase is designed to achieve the following objectives:

1. To develop understanding of human growth and development with special emphasis on the adolescent years.
2. To develop understanding of the nature of learning, how it takes place, and some factors which may enhance or inhibit its progress.
3. To develop understanding of materials and methods as they relate to learning in the student's area of specialization.
4. To develop skills necessary for wise use of materials, methods and resources applicable to instruction in the student's area of specialization.
5. To develop understanding of the purposes, organization, and administration of the school system, with special emphasis on the role of the school system, with special emphasis on the role of the secondary teacher in the total program.
6. To develop understanding of the social, historical and philosophical foundations undergirding the American pattern of education.
7. To develop a knowledge of the total instructional process through direct observation and participation in teaching under strict supervision.
8. To develop the skills necessary for the manipulation of materials and methods and the guidance of the learning process through direct observation and practice of teaching under strict and constructive supervision.

Suggested Professional Education Sequence

Sophomore Year

<i>Fall</i>		<i>Spring</i>	
Ed. 300.....	2	Ed. 301.....	2
Psy. 320.....	3		<u>2</u>
	<u>5</u>		

Junior Year

<i>Fall</i>		<i>Spring</i>	
Ed. 400.....	3	Psy. 436.....	3
	<u>3</u>		<u>3</u>

Senior Year

<i>Fall</i>		<i>Spring</i>	
*Ed. 500.....	3	*Ed. 500.....	3
*Ed. 535, 536.....	3	*Ed. 535, 536.....	3
*Ed. 560.....	6	*Ed. 560.....	6
	<u>12</u>		<u>12</u>

*Professional Block—Students except those taking library science courses are restricted to 12 semester hours during the student teaching semester.

Certification

When the student completes the Teacher Education sequence, he must apply for state certification by (1) requesting a certification application from the Registrar's office and (2) requesting a copy of his official transcript to be attached to the application.

The student must take the National Teacher Examination, both the Common and Teaching Area Examinations, and he must have these scores on file in the Teacher Education Office. The student must have the minimum scores required by the State of North Carolina before he will be recommended by the University for a North Carolina teaching certificate.

COURSES IN EDUCATION

- 100. Orientation.** Credit 1(1-0)
(Formerly Education 2100)

A familiarization with methods of improving study, taking notes and using the library. Offered each semester of the Freshman year and during the Summer Session.

- 300. Introduction to Education.** Credit 2(2-0)
(Formerly Education 2120)

An overview of the historical background of the systems of education in the United States, their aims, organization and procedures, and of the principles and practices on all levels of the American educational system; emphasis on the requirements of North Carolina.

- 301. Philosophical and Sociological Foundations of Education.** Credit 2(2-0)
(Formerly Education 2121)

A view of the educative process and its philosophical foundations; emphasis on the philosophical implications of education as they relate to the pupil, curriculum, teacher, and the institution.

- 302. Field Experiences and Community Services** Credit 1-3

Field experiences as tutor, assistant, participant or employee in a school or education related institution, organization, agency, community, church, business, or industrial program involving interaction with children, youth or adults. Evaluation and written reports required. Planned in consultation with an instructor.

- 303. Socio-Philosophical Aspects of Education.** Credit 4(4-0)

An examination of past and contemporary factors in American Education through philosophical and sociological perspectives. Exploration of problems and possibilities inherent in relating theory and practice in education.

- 343. Methods and Materials of Bibliography.** Credit 2(2-0)

An examination and evaluation of the principles and methods of bibliographic planning with emphasis on library skills and search techniques.

- 400. Psychological Foundations of Education—Growth and Development.** Credit 3(2-2)
(Formerly Education 2154—Restricted to Teacher Education Students)

Psychological principles governing the interests and needs of preadolescence and adolescence; emphasis is placed on general principles of growth and development; physical, motor, intellectual, social, emotional and moral aspects. Observing, recording and interpreting human behavior including functional conceptions of learning will be provided in laboratory settings. Prerequisites: Psychology 320, Education 300, 301.

402. Extramural Studies I

Credit 1-3

Off-campus experiences, testing or exploring relevance of education to real world situations in an agency, organization, institution or business. Project report and evaluation by permission of department.

410. Organization and Administration of School Media Centers.

(Formerly Education 2110)

Credit 3(3-0)

The administrative organizational procedures including functions, acquisition and selection policies, services, program planning, and management of school media centers. Field experiences in school media centers.

411. Cataloging and Classification.

(Formerly Education 2111)

Credit 3(3-0)

Basic course in techniques of book and non-book description, their organization for services in libraries through decimal classification and their subject representation in the public catalog. Practice in laboratory.

412. School Library Reference Materials.

(Formerly Education 2112)

Credit 3(3-0)

The selection, evaluation and use of basic reference materials with emphasis on the selection of materials, study of contents, methods of location, and practical application.

413. Non-Book Materials.

(Formerly Education 2113)

Credit 3(3-0)

A study of principles and techniques for the selection, acquisition and use of non-book materials.

414. Reading Interest.

(Formerly Education 2114)

Credit 3(3-0)

Materials correlative to recreational and curricula reading. Special attention is given to the principles of selection based on reading interests and needs.

451. Foundations of Early Childhood Education

Credit 2(2-0)

The study of the historical background and the sociological, philosophical, economic factors, and current issues relating to early childhood education; the physical plant, equipment, supplies and other facilities necessary for appropriate experiences.

500. Principles and Curricula of Secondary Schools.

(Formerly Education 2140)

Credit 3(3-0)

The history, nature, and function of the secondary school and its relationship to the elementary school and adult life. Prerequisite: 12 semester hours in education and psychology.

501. Methods of Research and Evaluation in Health and Physical Education.

(Formerly 2160)

Credit 2(1-2)

The use of various research methods as applied to health education and physical education and the study of methods of evaluating biological, social and physiological outcomes for health education and physical education. Elementary statistical procedures are utilized. Prerequisite: Psychology 436.

510. Teaching Language Arts in the Intermediate Grades.

Credit 2(2-0)

Methods, content, resources, and materials for teaching speaking, listening, writing and spelling in grades 4-9.

511. Teaching Reading in the Intermediate Grades. Credit 2(2-0)

Basic course in the methods, materials, and techniques used in reading instruction from the primary area through the study skills techniques of high school. An examination of learning and the teaching of reading in light of curriculum adjustment and procedures for developing expanding reading skills in grades 4-9. Prerequisite: Psychology 451.

512. Social Studies in the Intermediate Grades. Credit 2(2-0)

The instructional program in the social studies. Emphasis on current methods, organization, materials, and resources.

513. Strategies in Teaching Science in the Intermediate Grades. Credit 2(2-0)

The examination, design, and evaluation of experiences for teaching science in grades 4-9.

514. Strategies in Mathematics Instruction for the Intermediate Grades. Credit 2(2-0)

Methods, materials, resources and evaluation for teaching modern mathematics in grades 4-9.

515. Principles and Techniques of Librarianship Credit 3(1-4)

A study of the relationship of school media centers to other social and educational agencies, standards for school media centers, and librarianship as a profession. Practical experience required.

525. Methods of Teaching Art. Credit 3(3-0)
(Formerly Education 2149)

A study of the aims, objectives, methods and techniques of art teaching in the modern schools. Special attention given to planning courses of material and correlation. Required of those wishing to qualify as art teachers. Prerequisites: 30 hours of Art and 15 hours of Education and Psychology.

526. Methods of Teaching English. Credit 3(3-0)
(Formerly Education 2144)

A study of materials and methods of teaching English in the high school. Required of those planning to teach English. Prerequisites: English 450, 430, 24 additional hours of English courses above English 100 and 15 semester hours in Education and Psychology.

527. Methods of Teaching Foreign Languages. Credit 3(3-0)
(Formerly Education 2148)

A study of the problems and difficulties experienced in teaching foreign languages. Special attention given to the matter of classroom aids, equipment, etc. Required of those students planning to teach the subject. Prerequisites: 27 hours of French and 15 semester hours of Education and Psychology.

528. Methods of Teaching Home Economics. Credit 3(3-0)
(Formerly Education 2151)

A study of the objectives, methods, and techniques necessary for teaching vocational homemaking on the secondary level.

529. Methods of Teaching Mathematics. Credit 3(3-0)
(Formerly Education 2147)

An evaluation of subject matter, materials, methods and techniques and objectives in the teaching of mathematics in the junior and senior high school. Required of those

planning to teach the subject. Prerequisites: 30 hours of mathematics and 15 hours of Education and Psychology.

- 530. Public School Music Methods.** Credit 2(2-0)
(Formerly Education 2141)

A comprehensive study of materials and methods in the teaching of public school music.

- 531. Vocal Methods and Materials.** Credit 3(3-0)
(Formerly Education 2142)

The teaching of vocal music in the public schools: vocal literature for vocal combinations in the public schools.

- 532. Band Methods.** Credit 3(3-0)
(Formerly Education 2145)

A study of school band organization and administration. (Fall)

- 533. The Teaching of Physical Education.** Credit 2(1-2)
(Formerly Education 2143)

A study of materials, methods and practice in planning, organizing and conducting physical education class activities. Prerequisites: Phy. Ed. 446 and an adequate number of other physical education courses.

- 534. The Teaching of Health Education.** Credit 2(2-1)
(Formerly Physical Education 2163)

Methods, materials and procedures for the teaching of health in the elementary and secondary schools. Prerequisites: Health Education 220 and 442.

- 535. Methods of Teaching Science.** Credit 3(3-0)
(Formerly Education 2150)

A study of methods, materials and techniques of teaching such subjects as Biology, Chemistry, Physics, and General Science in the high school. Required of all those planning to teach in this field. Prerequisites: 27 hours of Science and 15 semester hours of Education and Psychology.

- 536. Methods of Teaching Social Sciences.** Credit 3(3-0)
(Formerly Education 2146)

A study of techniques of social science instruction on the high school level. Required of those planning to teach the subject. Prerequisites: 27 hours of Social Studies and 15 semester hours of Education and Psychology.

- 539. Methods of Teaching Speech.** Credit 3(3-0)

A study of the aims, objectives, problems and difficulties experienced in teaching speech in the modern school. Special attention is given to the organization and coordination of both speech and theater curriculums, to planning courses of study, its presentation, and to the selection of materials and equipment required of all Speech and Theater Education majors. Prerequisites: 27 hours of speech and 15 hours of Education and Psychology.

- 556. Curriculum and Methods in Literature, Language Arts, and Social Studies in Early Childhood Education** Credit 3(2-2)

The study of basic principles underlying the social studies and language arts curriculum; children's literature; appropriate materials and methods for kindergarten-primary grades. Development of concepts and skills relating to the scope and importance of social studies and language arts in the total program. Laboratory and observation experiences.

557. Curriculum and Methods in Science and Mathematics in Early Childhood Education Credit 3(2-2)

Basic principles underlying the science and mathematics curriculum. Consideration of appropriate materials and methods for kindergarten through primary grades. Development of concepts and skills relating to the scope and importance of science and mathematics in the schools program. Laboratory and observation experiences.

558. Student Teaching and Seminar in Early Childhood Education Credit 6(2-8)

Observations and guided teaching experiences in the preschool laboratory and in kindergarten through grade three. Seminar experiences throughout the term.

559. Student Teaching and Seminar. Credit 6(2-8)

Actual teaching experiences under supervision in grades 4-9; seminar before, during and after field experiences. Prerequisites: Education 300, 303, 400, and Psychology 436, and Education 510-514.

560. Observation and Student Teaching. Credit 6(2-8)
(Formerly Education 2161)

The application and practice of methods, techniques, and materials of instruction in a real classroom situation under supervision, includes purposeful observation; organization of teaching materials; participation in other activities which will aid in developing a teacher (guidance activities, child accounting, co-curricular activities, parent-teacher associations, teachers' meetings), and ninety or more clock hours of actual teaching. Prerequisites: Overall GPA of 2.00 in both the professional sequence and the academic sequences major and minor areas of specialization; Ed. 500, Principles and Curricula of Secondary Schools and Ed. 525-536, Methods of Teaching . . . completed or taken concurrently.

Before enrolling in this course, a student must repeat any required major field course or Education course, except Psych. 320 and Ed. 300, in which he receives a grade of D. The repetition will not be considered in the hours required for graduation but the hours and the grade of the repetition will be included in the determination of the overall grade point average.

561. Seminar. Credit 1(1-0)
A consideration of selected topics and current trends in the field of education.

Advanced Undergraduate and Graduate

602. Extramural Studies II Credit 1-3

Off-campus experiences with educational programs of agencies, organizations, institutions or business which gives first hand experiences with youth and adults and aspects of education. Project report and evaluation by permission of department.

610. Organization and Administration of School Media Centers Credit 3(3-0)

The administrative organizational procedures including functions, organization and selection policies, program planning, and management of school media centers.

625. Theory of American Public Education. Credit 3(3-0)
(Formerly 2180)

An examination of the philosophical resources, objectives, historical influences, social organization, administration, support, and control of public education in the United States.

626. History of American Education.

Credit 3(3-0)

(Formerly Education 2184)

A study of the historical development of education in the United States emphasizing educational concepts and practices as they relate to political, social, and cultural developments in the growth of a system of public education.

627. The Afro-American Experience in American Education.

Credit 3(3-0)

(Formerly Education 2181)

Lectures, discussions, and research in the Afro-American in American education including the struggle for literacy, contributions of Afro-Americans to theory, philosophy and practice of education in the public schools, private and higher education. Traces the development of school desegregation, its problems, and plans.

628. Seminar and Practicum in Urban Education

Credit 3(1-4)

A synthesis of practical experiences, ideas and issues pertinent to more effective teaching in urban areas.

630. Foundations in Reading.

Credit 3(3-0)

(Formerly Education 2179)

Basic reading course; consideration of the broad field of reading—its goals and nature; factors affecting its growth; sequential development of skills, attitudes and interests, types of reading approaches, organization and materials in teaching the fundamentals of reading.

635. Teaching Reading Through the Primary Years

Credit 3(3-0)

Methods, materials, and techniques used in reading instruction for preschool through grade three. An examination of learning, the teaching of reading, and curriculum experiences and procedures for developing reading skills.

636. Methods and Materials in Teaching Reading in the Elementary School.

Credit 3(3-0)

(Formerly Education 2171)

The application of principles of learning and child development to the teaching of reading and the related language arts. Methods and approaches to the teaching of reading in the elementary school, including phonics, developmental measures, informal testing procedures, and the construction and utilization of instructional materials.

637. Teaching Reading in the Secondary School.

Credit 3(3-0)

(Formerly Education 2178)

Nature of a developmental reading program initiating and organizing a high school reading program, the reading curriculum, including reading in the content subjects, critical reading, procedures and techniques, and corrective and remedial aspects.

638. Classroom Diagnosis in Reading Instruction.

Credit 3(3-0)

Methods, techniques, and materials used in the diagnosis of reading problems in the kindergarten-primary area through the intermediate level. Attention upon the pupil and the interpretation of physiological, psychological, sociological, and educational factors affecting learning to read. Opportunity for identification analysis interpretation on, and strategies for fulfilling the reading needs of all pupils. Prerequisite: Psychology 541.

639. Reading Practicum.

Credit 3(0-6)

Application of methods, materials and professional practices relevant to teaching pupils. Provisions for participation in and teaching of reading. Designed to coordinate the student's background in reading, diagnosis, learning, and materials. Student teaching in a public school. Prerequisite: 12 credit hours in reading.

640. Reading for the Atypical Learner Credit 3(3-0)

Attention to the gifted child, the able retarded, the slow learner, the disadvantaged, and the linguistically different child. Special interest groups will be formed for investigative reports.

641. Teaching the Culturally Disadvantaged Learner. Credit 3(3-0)
(Formerly Education 2771)

Psychological and sociological influences on culturally deprived learners and their development; emphasis on the experiential lacks of the culturally deprived learner; and special teaching methods, materials and activities. A consideration of groups of American Indians, Negroes, Puerto Ricans, urban poor, rural poor, Mexican Americans, Mountain whites, and migrant workers who may be culturally deprived.

642. Preparation of Audiovisual Materials. Credit 3(2-2)
(Formerly Education 2176)

The development and application of basic skills in the production of graphic and audio teaching materials as media of communications. Preparing instructional materials as they relate to educational programs.

644. Utilization of Audiovisual Media Credit 3(2-2)

A consideration of the improvement of instruction through the use of Audiovisual Media. Includes learning and communications theory, selection, utilization, evaluation, systems approach, and the integration of audiovisual materials, equipment, and resources in the implementation of the curriculum and educational programs; the design and care of instructional materials, locating source materials; and the operation and care of related equipment.

650. Book Selection and Related Materials for Children. Credit 3(3-0)
(Formerly Education 2075)

A study of children's literature with emphasis on aids and criteria for selection of books and other materials for preschool through late childhood ages, storytelling, and an investigation of reading interests.

651. Book Selection and Related Materials for Young People. Credit 3(3-0)
(Formerly Education 2076)

A consideration of literature, reading interests, and non-book materials for young people.

652. Foundations of Librarianship. Credit 3(3-0)
(Formerly Education 2078)

A history of books, libraries, and current trends in librarianship.

653. Building Library Collection. Credit 3(3-0)
(Formerly Education 2077)

Criteria for evaluating and selecting library materials, devising and maintaining an acquisition program.

660. Introduction to Exceptional Children. Credit 3(3-0)
(Formerly Education 2372)

An overview of the educational needs of exceptional or "different" children in the regular classroom situation; emphasis placed on classroom techniques known to be most helpful to children having hearing losses, speech disorders, visual problems, emotional, social handicaps and intelligence deviation, including slow-learners and gifted children. An introduction to the area of special education. Designed for classroom teachers.

- 661. Psychology of the Exceptional Child.** Credit 3(3-0)
(Formerly Education 2373)

An analysis of psychological factors affecting identification and development of mentally retarded children, physically handicapped children, and emotionally and socially maladjusted children.

- 662. Mental Deficiency.** Credit 3(3-0)
(Formerly Education 2376)

A survey of types and characteristics of mental defectives; classification and diagnosis; criteria for institutional placement and social control of mental deficiency. Prerequisites: Special Education 660 and 661.

- 663. Measurement and Evaluation in Special Education.** Credit 3(2-2)
(Formerly Education 2375)

The selection, administration, and interpretation of individual tests; intensive study of problems in testing exceptional and extremely deviate children; consideration to measurement and evaluation of children that are mentally, physically, and emotionally or socially handicapped. Emphasis upon the selection and use of group tests of intelligence and the interpretation of their results.

- 664. Materials Methods, and Problems in Teaching Mentally Retarded Children.** Credit 3(2-2)
(Formerly Education 2377)

Basic organization of programs for the education of the mentally retarded: classification and testing of mental defectives; curriculum development and principles of teaching intellectually slow children. Attention is also given to the provision of opportunities for observing and working with children who have been classified as mentally retarded. Prerequisites: Special Education 660, 661, and 663.

- 665. Practicum in Special Education.** Credit 3(0-6)

Observation, participation, and teaching in an educational program for the mentally retarded.

- 670. Introduction to Adult Education.** Credit 3(3-0)
(Formerly Education 2172)

The history, philosophy, and general organization and administrative problems of adult education.

- 671. Methods in Adult Education.** Credit 3(2-2)
(Formerly Education 2173)

Methods of informal instruction, group leadership, conference planning, and techniques in handling various issues of interest to adults. For persons preparing to conduct adult education programs as well as those preparing to serve as instructors or leaders in the public schools and/or in various agencies serving adults. Prerequisite: Education 671.

- 683. Curriculum in Early Childhood.** Credit 3(3-0)
(Formerly Education 2080)

Curriculum experiences and program planning appropriate to nursery and kindergarten education.

- 684. Methods in Early Childhood.** Credit 3(3-0)
(Formerly Education 2079)

Administration, principles, practices, methods, and resources in the organization of preschool and primary programs. An interdisciplinary and team approach. Observation for teaching styles and strategies.

GRADUATE COURSES

These courses are open only to graduate students. For descriptions of them, see the *Graduate School Bulletin*.

700. Introduction to Graduate Study. (Formerly 2294)	Credit 2(2-0)
701. Philosophy of Education. (Formerly 2185)	Credit 3(3-0)
702. Readings in Modern Philosophy of Education. (Formerly 2092)	Credit 3(3-0)
703. Educational Sociology. (Formerly 2195)	Credit 3(3-0)
710. Methods and Techniques of Research. (Formerly 2189)	Credit 3(3-0)
711. Educational Statistics. (Formerly 2299)	Credit 3(2-2)
720. Curriculum Development. (Formerly 2085)	Credit 3(3-0)
721. Curriculum in the Elementary School. (Formerly 2296)	Credit 3(3-0)
722. Curriculum in the Secondary School. (Formerly 2187)	Credit 3(3-0)
723. Principles of Teaching. (Formerly 2295)	Credit 3(3-0)
724. Problems and Trends in Teaching Science. (Formerly 2193)	Credit 3(3-0)
725. Problems and Trends in Teaching Social Sciences. (Formerly 2192)	Credit 3(3-0)
726. Workshop in Methods of Teaching Language Arts. (Formerly 2291)	Credit 2(2-0)
727. Workshop in Methods of Teaching Modern Mathematics for Junior and Senior High School Teachers. (Formerly 2087)	Credit 3(3-0)
728. Workshop in Methods of Teaching Modern Mathematics in Elementary Schools. (Formerly 2290)	Credit 3(3-0)
736. Workshop in Audiovisual Media. (Formerly 2191)	Credit 3(1-4)
737. Organization and Administration of Audiovisual Programs. (Formerly 2190)	Credit 3(3-0)
739. Reading in the Content Areas	Credit 3(3-0)

740. Problems in the Improvement of Reading. (Formerly 2094)	Credit 3(3-0)
741. Advanced Diagnosis in Reading Instruction	Credit 3(3-0)
742. Organization and Administration of Reading Programs	Credit 3(3-0)
743. Advanced Practicum in Reading	Credit 3(0-6)
744. Seminar and Research in Reading	Credit 3(3-0)
745. Advanced Reference and Bibliography. (Formerly 2293)	Credit 3(3-0)
746. Principles and Problems in Cataloging and Classification. (Formerly 2298)	Credit 3(3-0)
755. Supervision of Instruction. (Formerly 2086)	Credit 3(3-0)
756. Supervision of Student Teachers. (Formerly 2285)	Credit 3(3-0)
757. Problems in Supervision of the Elementary School. (Formerly 2197)	Credit 3(3-0)
758. Problems in High School Supervision. (Formerly 2199)	Credit 3(3-0)
760. The Junior High School. (Formerly 2088)	Credit 3(3-0)
761. Administration of the Elementary School. (Formerly 2196)	Credit 3(3-0)
762. High School Administration. (Formerly 2198)	Credit 3(3-0)
763. Public School Administration. (Formerly 2091)	Credit 3(3-0)
764. Pupil Personnel Administration. (Formerly 2297)	Credit 2(2-0)
765. School Publicity and Public Relations. (Formerly 2194)	Credit 3(3-0)
766. School Planning. (Formerly 2186)	Credit 3(3-0)
767. Public School Finance. (Formerly 2095)	Credit 3(3-0)
768. Principles of School Law. (Formerly Education 2174)	Credit 3(3-0)
769. Problems in Educational Administration and Supervision. (Formerly 2089)	Credit 3(0-6)
755. The Community College and Post Secondary Education. (Formerly 2393)	Credit 3(3-0)

776. Principles of College Teaching. (Formerly 2394)	Credit 3(3-0)
780. Comparative Education. (Formerly 2093)	Credit 3(3-0)
781. Issues in Elementary Education. (Formerly 2286)	Credit 3(3-0)
782. Issues in Secondary Education. (Formerly 2287)	Credit 3(3-0)
783. Current Research in Elementary Education. (Formerly 2288)	Credit 3(3-0)
784. Current Research in Secondary Education. (Formerly 2289)	Credit 3(3-0)
785. Independent Readings in Education I. (Formerly 2395)	Credit 1(0-2)
786. Independent Readings in Education II. (Formerly 2396)	Credit 2(0-4)
787. Independent Readings in Education III. (Formerly 2397)	Credit 3(0-6)
790. Seminar in Educational Problems. (Formerly 2392)	Credit 3(1-4)
791. Thesis Research. (Formerly 2292)	Credit 6(0-12)
792. Advanced Seminar and Internship in Educational Administration. (Formerly 2090)	Credit 3(0-6)

DEPARTMENT OF PSYCHOLOGY AND GUIDANCE

S. JOSEPH SHAW, *Acting Chairman*

The Department of Psychology and Guidance assumes four functions in the educational program of the University. First, through graduate courses in child growth and development, educational psychology, measurement and evaluation, and mental hygiene, the department attempts to provide for the needs of graduate education majors in the psychological foundations of education. Second, the department in collaboration with other departments of the University provides a sequence of guidance and psychology courses required for the graduate education major with a concentration in guidance. For a more detailed description of these two programs, see the *Graduate School Bulletin*.

The third and fourth functions of the department involve the provision of sequences of courses designed to meet the needs of the undergraduate minor and undergraduate major in psychology, respectively. These two functions are described in some detail below following which course descriptions are presented.

THE UNDERGRADUATE PROGRAM IN PSYCHOLOGY

Both the undergraduate major and minor programs in psychology are primarily aimed at providing a broad general education rather than specialized professional training in psychology. If it can be assumed that this maximum development of the individual intellectually, emotionally, socially, and physically, then the unique contributions of the undergraduate psychology programs are at least two in number: (1) development of psychological knowledge of potential usefulness in solving problems of personal and social living; and (2) development of a better understanding of the problems of the arts and sciences by helping students more effectively approach these as problems of scientific inquiry.

With respect to pre-professional training in psychology, both programs are designed to attempt to develop the following additional attributes in students who minor or major in the discipline.

1. Knowledge of the many facts and, as yet, relatively few principles or laws of behavior which make up the subject-matter of psychology;
2. Rigorous habits of thinking;
3. Acceptance of knowledge of behavioral phenomena as a value in itself rather than knowledge acquired solely for immediate and practical ends; and,
4. Acceptance of the probability nature of most psychological data and hence, the need for attitudes of caution and responsibility in the acceptance of these data.

It is assumed that these pre-professional objectives will be attained with minors in psychology and majors in psychology differentially and that these differences will represent matters of degree rather than kind.

THE MAJOR IN PSYCHOLOGY

The major program is designed for the student whose occupational goal, following pre-professional undergraduate and professional graduate training is in the general field of psychology. Samples of specific positions for which these two levels of training prepare the individual are: college professor, experimental psychologist, social psychologist, public opinion analyst, test designer, clinical psychologist, research industrial psychologist, management consultant, school psychologist, rehabilitation worker, vocational counselor, and psychometrist.

Students with majors in psychology must first satisfy general education graduate requirements prescribed by the School of Education with respect to English, foreign languages, health and physical education, humanities, and orientation. The mathematics' requirements for psychology majors include Analytic Geometry and Calculus; the science requirements include one course in Biological Science, one course in Human Anatomy and Physiology, and one course in Physical Science; and the social science requirements include Western Civilization I and II and one course in Principles of Sociology. Psychology majors will preferably complete Elementary Psychology rather than the course in General Psychology which represents a School general education requirement for nonpsychology majors.

Requirements in the area of specialization, including Elementary Psychology, are completion of twelve (12) courses provided by the Department of Psychology and Guidance with a minimum cumulative grade point average equaling or exceeding the overall minimum cumulative grade point average required by the University for graduation. Nine of the courses, including three courses of one academic year's duration, are prescribed. The additional courses are departmental electives and should be selected

with the approval of the student's advisor from among those listed below the *Suggested Course Sequence for the Major in Psychology*.

THE MINOR IN PSYCHOLOGY

The minor program in psychology is designed for the student who desires training in the discipline beyond the level of an introductory course but whose occupational objectives are in fields other than psychology. These include law, medicine, education, social welfare, business administration, and the like. Such students will normally pursue those general education courses and major courses which are prescribed by the departments in which they are registered during the first two years of college work.

In addition, during their sophomore year, they will pursue Psychology 320—General Psychology and Psychology 322—Statistical Methods (or an equivalent first course in statistics) the first semester, and Psychology 323—Social Psychology the second semester. During the junior and senior years, the psychology minor will pursue an additional fifteen semester hours in psychology selected from among other course offerings of the department, the only restriction being that the selection is limited to those courses whose prerequisites have been previously met.

COURSE SEQUENCE FOR THE MAJOR IN PSYCHOLOGY

Freshman Year

<i>Course and Number</i>	<i>First Sem.</i>	<i>Second Sem.</i>
Biological Science 100.....	4	—
Education 100.....	1	—
English 100; 101.....	3	3
History 100; 101.....	3	3
Mathematics 101; 102 or 110; 111	3	3
Physical Science 100	—	4
Physical Education	1	1
	—	—
	15	14

Sophomore Year

Speech 250	2	
French 100, 101; or 300, 301, or German 102, 103 or Spanish 320, 321	3	3
Health Education 200	2	—
Humanities 200, 201	3	3
Psychology 321, 323 (Elementary & Social Psychology)	3	3
Psychology 322	—	3
Sociology 100 (Formerly Sociology 203)	3	—
Zoology 461	—	4
	—	—
	16	16

Junior Year

<i>Course and Number</i>	<i>First Sem.</i>	<i>Second Sem.</i>
Psychology 430, 431 (Child and Adolescent Development)	3	3
Psychology 432, 433 (Experimental Psychology I, II) ..	3	3
Psychology 434 (Abnormal Psychology)	3	—
Departmental Electives	3	6
Free Electives	3	4
	<hr/> 15	<hr/> 16

Senior Year

Psychology 439, 541 (Theories of Personality, Psychology of Learning)	3	3
Psychology 542, 543 (Seminar in Psychology I and II)	3	3
Free Electives	9	9
	<hr/> 15	<hr/> 15

DEPARTMENTAL ELECTIVE COURSES FOR THE MAJOR IN PSYCHOLOGY**(A minimum of three courses required)**

Psychology 435. Educational Psychology
 Psychology 436. Tests and Measurements
 Psychology 444. Applied Psychology
 Psychology 438. Computer Programming
 Psychology 621. Psychology of the Exceptional Child
 Psychology 540. Physiological Psychology
 Psychology 622. Mental Deficiency
 Psychology 445. Industrial Psychology

COURSES IN PSYCHOLOGY**Undergraduate**

320. General Psychology Credit 3(3-0)
 (Formerly 2020)

An introduction to psychology as a life science especially designed for the major in areas other than psychology. Topics given major consideration include maturation and development; motivation, emotion, and personality; mental health; intelligence and aptitudes; perception and attention; learning, forgetting, language, and thinking; social influences, attitudes, and beliefs, and vocational adjustment.

321. Elementary Psychology Credit 3(3-0)
 (Formerly 2021)

An introduction to psychology as a behavioral science required of the major in psychology with enrollment restricted to such majors. Major areas of consideration include

maturation and development; nervous system and internal environment; physiological basis of behavior; sensory processes and perception; learning, thinking and language; motivation, emotion, and personality; and, psychological testing.

322. Statistical Methods
(Formerly 2022)

Credit 3(3-0)

Analysis and interpretation of research data. Descriptive statistics (frequency distributions, centrality, variability and correlation of measures), introduction to statistical inferences (normal curve sampling theory, chi-square tests of statistical hypotheses, t-tests, analysis of variance, Scheffe test ratio).

323. Social Psychology
(Formerly 2023)

Credit 3(3-0)

An introduction to the study of the behavior of the individual in relation to factors in his social environment. Socialization, enculturation, attitude formation and modification, social influence on perceptual and conceptual processes, and social interaction.

430. Child Development
(Formerly 2030)

Credit 3(2-2)

A comprehensive study of the physical, social, emotional, personality, language and intellectual development of the child from birth through early childhood.

431. Adolescent Development
(Formerly 2031)

Credit 3(3-0)

A continuation of Child Development with emphasis on the periods of middle childhood through adolescence.

432. Experimental Psychology I
(Formerly 2032)

Credit 3(2-2)

The first of a two-semester sequence in experimental psychology unifying subject matter (content) and methodology. Emphasis on application of experimental methodology in the analysis of such behavioral phenomena as perceptual processes, motivation, frustration and conflict.

433. Experimental Psychology II
(Formerly 2033)

Credit 3(2-2)

Continuation of Experimental Psychology I. Emphasis on application of experimental methodology in the analysis of such behavioral phenomena as simple and complex learning, transfer, retention, forgetting, perceptual-motor learning, verbal learning, and problem solving.

434. Abnormal Psychology
(Formerly 2034)

Credit 3(3-0)

Behavior deviations and psychological disorders occurring during the several developmental stages; basis concepts employed in psycho-pathology, mental hygiene, and psychiatry.

435. Educational Psychology
(Formerly 2035)

Credit 3(3-0)

A study of basic problems underlying the psychology of education; individual differences, development of personality, motivation of learning and development, nature of learning and procedures which best promote its efficiency.

436. Tests and Measurements Credit 3(2-2)
(Formerly 2036)

A basic study of standardized and teacher-made measuring devices, acceptable methods of selecting, administering, and interpreting all types of tests applicable to the school and classroom.

437. Mental Hygiene Credit 3(3-0)
(Formerly 2037)

A study of basic principles of adjustment and mental hygiene.

438. Computer Programming Credit 3(1-4)
(Formerly 2038)

The theory of and practical experience in block diagramming, programming and computer operation. Programming with the P.L.I. language and processing via teletypewriter remote console connected to the IBM 360. All students will be required to write, test, and run original as well as standard computer programs.

439. Theories of Personality Credit 3(3-0)
(Formerly 2039)

Contemporary theoretical formulations of the structure and development of personality and their empirical bases.

444. Applied Psychology Credit 3(2-2)
(Formerly 2044)

The utilization of psychological principles in five areas of American culture; effectively training new generations; maintaining mental health; administering justice; promoting economic progress; and facilitating efficient production.

445. Industrial Psychology Credit 3(2-2)

A consideration of the significance of individual differences in industry; employee selection and training; reduction of monotony and fatigue and the promotion of efficiency; accident prevention; psychological factors in employee turnover.

540. Physiological Psychology Credit 3(2-2)
(Formerly 2040)

A study of the physiological and chemical processes (and their anatomical substrates) that intervene between the arrival of sensory impulses in the central nervous system and the elaboration of responses to them.

541. Psychology of Learning Credit 3(3-0)
(Formerly 2041)

A general survey of those changes in performance as a function of practice subsumed under the label "learning" consideration is given to the basic controlling variables—individual responses; such interactions of learned responses as chaining and transfer of training; and processes under the control of implicit and mediating activity such as retention and problem solving.

542. Seminar in Psychology I Credit 3(3-0)
(Formerly 2042)

A study of selected major systematic views and theoretical issues in psychology. Each student participates in supervised research in psychological journals and other materials leading to an oral presentation and written paper on a substantive view or issue in psychology.

543. Seminar in Psychology II
(Formerly 2043)

Credit 3(3-0)

A continuation of Psychology 542.

Advanced Undergraduate and Graduate**623. Personality Development**
(Formerly 2073)

Credit 3(3-0)

A study of the basic processes in personality development, the contents of personality, and consequences of personality development.

661. Psychology of the Exceptional Child
(Formerly 2071)

Credit 3(3-0)

An analysis of psychological factors affecting identification and development of mentally retarded children, physically handicapped children, and emotionally and socially maladjusted children.

662. Mental Deficiency
(Formerly 2072)

Credit 3(3-0)

A survey of types and characteristics of mental defectives; classification and diagnosis; criteria for institutional placement and social control of mental deficiency.

Graduate

These courses are open only to graduate students. For descriptions of them see the *Graduate School Bulletin*.

726. Educational Psychology
(Formerly 2096)

Credit 3(3-0)

727. Child Growth and Development
(Formerly 2097)

Credit 3(3-0)

728. Measurement and Evaluation
(Formerly 2098)

Credit 3(2-2)

729. Mental Hygiene for Teachers
(Formerly 2099)

Credit 3(3-0)

**DEPARTMENT OF HEALTH, PHYSICAL EDUCATION
AND RECREATION**ROY D. MOORE, *Chairman*

The objectives of the Department of Health, Physical Education and Recreation are:

1. To provide instruction in a wide variety of physical education activities to meet the needs and interests of all students in the required general education program of the University.
2. To promote participation in wholesome extra-class activities through sponsoring and supervising such organizations as the Aquatics Club, Cheerleaders' Squad,

Dance Group, Gymnastics Club, Women's Athletic Association, Intramural Leagues, and Officiating Club.

3. To provide recreational outlets for students and members of the College community through conduct of informal recreational activities.
4. To enrich the total University program through cooperation with the programs of such units of the University as the music and dramatic groups, alumni association, agricultural homemaking groups, guidance and health service divisions.
5. To provide necessary preparation for students planning careers as teachers of elementary, junior and senior high school health and physical education and as athletic coaches and recreational administrators.
6. To provide courses in health, physical education which meet State and National Teacher Certification standards.
7. To provide courses in Recreation which meet guidelines of National Recreation and Park Administration.

Each major is required to complete a minimum total of fourteen competencies of the following:

- 3—Team Sports
- 3—Individual and Dual Sports
- 2—Gymnastics
- 2—Dance
- 4—Swimming

Each major is also required to specialize in one of the following areas: Team Sports, Individual and Dual Sports (includes officiating), Gymnastics, Dance or Swimming.

During the Junior and Senior years before student teaching, the major will be assigned to an instructor and assist in the basic program. Freshmen Physical Education majors will be placed in PE 101 and PE 102.

SUGGESTED PROGRAM IN HEALTH AND PHYSICAL EDUCATION FOR MAJORS

Freshman Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
English 100, 101.....	3	3
Mathematics 101, 102	3	3
History 100, 101.....	3	3
Biological Science 100.....	4	—
Physical Science 100	—	4
Physical Education 101, 102, 103, and 104	1	—
English 102 (1 hour either semester)	—	1
Education 100 (1 hour either semester)	1	—
Air or Military Science or Electives	1	1
	16+	16+

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Education 300, 301	2	2
English 250	2	—
Humanities 200, 201	3	—
Foreign Language	3	3
Psychology 320	3	—
Zoology 160	—	4
Health Education 200, 220	2	2
Physical Education 229, 231	1	1
Physical Education 234 (W), 235 (W)	1	1
Physical Education 237 (M), 238 (M)	1	1
Physical Education 246 (W), 247 (W)	1	1
Physical Education 249 (M), 251 (M)	1	1
Physical Education 261, 361	1	1
Air or Military Science (Optional)	2	2
	—	—
	21	20

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Education 400	3	—
Psychology 436	—	3
Zoology 469, 560	3	3
Health Education 440	2	—
Physical Education 445	—	2
Physical Education 446	3	—
Health Education 442	—	3
Physical Education 448, 450	1	1
Physical Education 451, 452	1	1
Physical Education 453 (W), 455 (W)	2	2
Physical Education 456 (M), 458	2	2
Physical Education 460, 461 (M)	2	2
Physical Education 462	2	—
	—	—
	21	19

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Education 501	2	—
Health Education 560	2	—
Education 500	—	3
Physical Education 563	2	—
Education 533	—	2
Education 560	—	6
Physical Education 566	3	—
Physical Education 567, 568	1	1
	—	—
	10	12

Suggested Program for Recreation Majors

Freshman Year

<i>1st Semester</i>	<i>S.H.</i>	<i>2nd Semester</i>	<i>S.H.</i>
English 100	3	English 101	3
Mathematics 101	3	Mathematics 102	3
History 100	3	History 101	3
Biological Science 100	4	Physical Science 101	4
Phy. Ed. 101 or Phy. Ed. 102	1	Phy. Ed. 103 or 104	1
English 102	1		
Education 100	1	Air or Military Sc. (Optional)	1
Air or Military Sc. (Optional)	1		
	<hr/> 17		<hr/> 15

Sophomore Year

<i>1st Semester</i>	<i>S.H.</i>	<i>2nd Semester</i>	<i>S.H.</i>
Humanities 200	3	Humanities 201	3
Phy. Ed. 460—Community Rec.	2	Soc. 203—Prin. of Soc.	3
English 250—Speech	1	H. E. 442—First Aid & Safety	3
Psychology 320—General Psy.	3	Phy. Ed. 229—Dance	1
H. E. 200—Personal Hygiene	2	H. E. 220—Community Health	2
Economics 301—		Psy. 323—Soc. Psychology	3
Elements of Econ.	3	Art 401—Ceramics	1
Phy. Ed. 261—		Air or Military Sc. or Elc.	1
Beginning Swimming	1		
Air or Military Sc. (Optional)	1		
	<hr/> 16		<hr/> 17

Junior Year

<i>1st Semester</i>	<i>S.H.</i>	<i>2nd Semester</i>	<i>S.H.</i>
Rec. 402—Field Experience I	2	Rec. 408—Field Experience II	2
Ind. Art 210—Leathercraft	2	Rec. 463—Outdoor Recreation	2
Phy. Ed. 361—Swimming	1	Rec. 465—Program Planning	
Phy. Ed. 231—Dance	1	in Recreation	3
Pol. Sci. 442—Municipal Gov.	3	Rec. 466—Camp Administration	3
Phy. Ed. 247—Ind. Sports		Phy. Ed. 448—Gymnastics	1
& Rec. Games	1	Phy. Ed. 459—Tennis	1
Rec. 464—Group Leadership	2		
Music 119—Recreation	2		
	<hr/> 14		<hr/> 12

Senior Year

<i>1st Semester</i>	<i>S.H.</i>	<i>2nd Semester</i>	<i>S.H.</i>
Rec. 509—Field Exp. III	2	Rec. 510—Field Exp. IV	2
Education 402—Audiovisual Aids, . .	2	Rec. 561—Met. or Research & Evaluation in Recreation	3
Rec. 564—Supervision of Rec. & Park Services	3	Soc. 204—Social Problems	3
PE 566—Administration of HPER	3	Foreign Language	3
Foreign Language	3	Electives	4
Elective	1		
	<hr/> 14		<hr/> 15

HEALTH EDUCATION COURSES**Undergraduate**

- 200. Personal Hygiene.** Credit 2(2-0)
(Formerly 2700)

This course is designed to give the student definite knowledge of the principles of personal health, both mental and physical, and to prepare him for self guidance through and beyond the college years. Emphasis is placed upon information pertinent to social behavior today and upon effective approaches to college living.

- 220. Community Health.** Credit 2(2-0)
(Formerly 2720)

An introductory study of environmental factors which affect health. Emphasis will be placed upon the health of the group rather than that of the individual. Consumer health, community resources for health and prevention and control of disease through organized community efforts will be stressed. (Prerequisite 200.)

HEALTH EDUCATION COURSES FOR MAJOR STUDENTS

- 440. Advanced Hygiene and Principles of Health Education.** Credit 2(2-0)
(Formerly 2740)

A comprehensive review of health facts and scientific principles applicable to the prospective teacher, the school child, and the community. Fundamentals of health promotion in the school program are considered. (Prerequisite: HE 200, 201.)

- 442. First Aid, Safety, and Prevention of Injuries.** Credit 3(2-2)
(Formerly 2745)

Techniques of first aid to the injured in the home, school and community and the teaching of safety measures to be practiced in daily living; the prevention and care of the injuries occurring in physical education classes and in competitive sports. The standard Red Cross First Aid Certificate is awarded upon successful completion of the course. (Prerequisite: Zoo. 469.)

- 560. The Teaching of Health Education.** Credit 2(2-1)
(Formerly 2760)

Methods, materials and procedures for the teaching of health in the elementary and secondary schools. (Prerequisites: Health Education 220 and 442, Zool. 469, 560 and HE 440.)

ADVANCED UNDERGRADUATE AND GRADUATE HEALTH COURSES

- 651. Personal, School and Community Health Problems.** Credit 3(3-0)
(Formerly 2771)

A study of personal, school and community health problems and resources. Emphasis is placed on the control of communicable diseases, healthful school living and the development of individuals of the scientific attitude and a positive philosophy of healthful living.

- 652. Methods and Materials in Health Education for
Elementary and Secondary School Teachers.** Credit 3(3-0)
(Formerly 2772)

A study of the fundamentals of the school health program, pupil needs, methods, planning instruction, teaching techniques, selection and evaluation of materials for the elementary and secondary programs, and the use of the community resources.

GENERAL PHYSICAL EDUCATION REQUIREMENT

Requirements for Women

FRESHMEN REQUIREMENTS: Physical Education 102 and 104

Requirements for Men

FRESHMEN REQUIREMENTS: Physical Education 101 and 103

- 101. Fundamentals of Physical Education. Men. Fall.** Credit 1(0-2)
(Formerly 2701)

To develop an understanding of the value and the logic behind exercise and sports activity and regular habits of exercise, to determine the physical fitness needs of the student with the nature, basic rules, techniques and skills of a wide variety of popular American sports and guide him into activities which will be of most interest and benefit to him now and in the future.

- 102. A continuation of 101.** Credit 1(0-2)
(Formerly 2703)

- 261. Swimming, Beginning. Fall or Spring.** Credit 1(0-2)
(Formerly 2711)

To teach the elementary skills as outlined in the American Red Cross Standards for beginning swimmers.

- 112. Adapted Physical Education.** Credit 1(0-2)
(Formerly 2712)

Special activities designed for those students whose physical examination show that they are unable to participate in the regular physical education classes.

- 262. Adapted Physical Education.** Credit 1(0-2)
(Formerly 2713)

A continuation of 112.

- 251. Softball, Soccer, and Volleyball (Men).** Credit 1(0-2)
(Formerly 2721)
To develop an understanding of rules, strategy and performance skills in softball, soccer, and volleyball.
- 252. Touch Football, Speedball, and Basketball. (Men).** Credit 1(0-2)
(Formerly 2722)
To develop an understanding of rules, strategy and performance skills in touch football, speedball, and volleyball.
- 234. Team Sports: Hockey, Soccer, Basketball (Women).** Credit 1(0-2)
(Formerly 2724)
Fundamental techniques, rules, strategy, terminology, and cultural significance of field hockey, soccer and basketball.
- 235. Team Sports: Volleyball, Speedball, Softball. (W).** Credit 1(0-2)
(Formerly 2725)
Fundamental techniques, rules, strategy, terminology and cultural significance of volleyball, speedball, and softball.
- 246. Individual Sports: Archery, Tennis, Badminton, Golf.** Credit 1(0-2)
(Formerly 2726)
Fall or Spring. Techniques, rules, playing courtesies, and significance of individual sports to college and after school life.
- 247. Individual Sports: Recreational Games.** Credit 1(0-2)
(Formerly 2727)
Shuffleboard, handball, deck tennis, table tennis, croquet, modified bowling and horseshoe.
- 261. Swimming for Intermediates.** Credit 1(0-2)
(Formerly 2728)
- 229. Modern Dance.** Credit 1(0-2)
(Formerly 2729)
To develop an understanding of the various qualities of movement; the techniques of obtaining and applying them in the art form of dance.
- 231. Folk and Tap Dance.** Credit 1(0-2)
(Formerly 2731)
Clog, tap and folk dances characteristic of many nationalities.
- 263. Rhythmics.** Credit 1(0-2)
(Formerly 2732)
Suitable types of rhythmical activities for boys and men including fundamental movements, folk, tap, social dance and singing games.
- 233. Social and Country Dance.** Credit 1(0-2)
(Formerly 2733)
Ballroom, square, and round dance forms; fundamentals leading and following, dance etiquette.
- 450. Advanced Gymnastics (M) (W).** Credit 1(0-2)
(Formerly 2734)
Men: Fundamental skills and routines on the following gymnastics apparatus: rings, parallel bars, horizontal bar, and side horse.

Women: Fundamental skills and routines on the following gymnastic apparatus: uneven parallel bars, balance beam, side horse vault, and floor exercise. This course will include basic evaluation and methods.

- 454. Adapted Physical Education.** Credit 1(0-2)
(Formerly 2735)

A continuation of 262.

- 248. Adapted Physical Education.** Credit 1(0-2)
(Formerly 2736)

A continuation of 454.

- 441. Beginning Golf.** Credit 1(0-2)
(Formerly 2741)

To develop performance skills and techniques in golf.

- 443. Skating for Beginners.** Credit 1(0-2)
(Formerly 2742)

To develop performance skills and techniques in ice skating.

- 457. Bowling.** Credit 1(0-2)
(Formerly 2743)

To develop performance skills and techniques in bowling.

- 344. Beginning Tennis and Badminton.** Credit 1(0-2)
(Formerly 2744)

To develop an understanding of rules, strategy and performance skills in tennis and badminton.

- 463. Swimming, Life Saving.** Credit 1(0-2)
(Formerly 2757)

To teach the fundamental skills and techniques as outlined in the American Red Cross Standards for Life Saving and Water Safety.

PHYSICAL EDUCATION COURSES FOR MAJOR STUDENTS

- 237. Group Games, Football and Basketball.** Credit 1(0-3)
(Formerly 2737)

Practice methods and applied techniques of a large variety of games of lower organization of the circle, group; and line types which might be suitable for playground, gymnasium, camp and for adult gatherings. Concentration on developing performance skills and understanding of football and basketball.

- 238. Baseball, Track and Field.** Credit 1(0-3)
(Formerly 2738)

To develop performance skills, methods, and techniques in baseball, track and field.

- 249. Individual Sports and Combatives.** Credit 1(0-3)
(Formerly 2739)

To develop performance skills in combatives and a wide variety of individual sports including shuffleboard, handball, table tennis, badminton, croquet, archery, golf, and tennis.

240. Introduction to Physical Education. Credit 2(2-0)
(Formerly 2740)

Survey of the nature and scope of physical education; interpretation of objectives and philosophy of physical education as a part of the total educational program. Qualifications, responsibilities, and opportunities of professional personnel. Evaluation of personal fitness and suitability to area of interest.

456. Teaching of Soccer, Football and Basketball. Credit 2(1-2)
(Formerly 2745)

Consideration is given to the teaching of history, rules, performance skills, methods or organizing practices, strategy, team offenses and defenses, and various formations for the three sports.

458. Lifesaving and Water Safety. Credit 2(1-2)
(Formerly 2746)

The teaching of swimming and lifesaving. Skills required for the American Red Cross standard Life Saving Certificate; instruction in desirable methods and techniques for the teaching of swimming and aquatic events. Prerequisite: 361 or equivalent.

448. Gymnastics I. (Men and Women). Credit 1(0-2)
(Formerly 2747)

An introduction to the basic skills of tumbling, floor exercise, trampoline and different types of vaulting. The course will include methods and basic evaluation.

461. The Teaching of Individual Sports and Net Games. Credit 2(1-2)
(Formerly 2748)

Methods and techniques for teaching individual sports including shuffleboard, handball, table tennis, badminton, archery, deck tennis, volley ball, newcomb, and paddle tennis.

446. History and Principles of Physical Education. Credit 3(3-0)
(Formerly 2749)

The evolution of physical education from the earliest time to the present day. Consideration of the relationship of physical education to education and to national life and ideas through the different historical periods. A critical analysis of the scientific basis for physical education with applications of the aims and objectives to the modern concepts of education.

462. Elementary School Physical Education. Credit 2(1-2)
(Formerly 2751)

Philosophy, program planning, and method for teaching children. Observation and instruction of children at various grade levels. Experiences in simple games, relays, stunts, tumbling, creative rhythms and dance movement exploration. (Prerequisite: 240—Admittance to the Teacher Education Program.)

445. Kinesiology. Credit 2(2-0)
(Formerly 2752)

A study of the body movements, types of muscles exercise and their relation to the problems of body development. (Prerequisite: Zoology 469.)

451. Dance Composition. Credit 1(0-2)
(Formerly 2753)

The rhythmical and musical basis of dance, the elements of dance construction. Theory and practice of skills involved. (Prerequisite: 229.)

453. Techniques and Methods in Fall and Indoor Activities. Credit 2(1-4)
(Formerly 2754)

Theory and practice of field hockey, soccer, archery, golf, basketball, gymnastics, and apparatus. Analysis of performance skills, materials and techniques. Opportunity for officiating and obtaining local and national official rating.

452. Applied Dance. Credit 1(0-2)
(Formerly 2755)

A coordinated course designed to increase skill in technique and the use of related art materials. (Prerequisites: 229, 231, 451.)

455. Techniques and Methods of Seasonal and Indoor Activities. Credit 2(1-4)
(Formerly 2756)

Theory and practice of volleyball, recreational games, speedball, softball, tennis, badminton, track, and field. Materials and teaching techniques, analysis of skills involved. Opportunity for obtaining officials' ratings.

560. Methods of Research and Evaluation in Health and Physical Education. Credit 2(1-2)
(Formerly 2760)

Same as Education 501.

460. Community Recreation. Credit 2(2-0)
(Formerly 2761)

A study of city, state, and national organization. Practice in the general principles and techniques in the organization and promotion of leisure activities for home, school, and community.

469. The Physiology of Exercise. Credit 3(2-2)

The purpose of this course is to observe and record the effects of physical activity on the organic systems and service organs of the human body and to learn basic laboratory techniques and procedures of physical education.

562. The Teaching of Physical Education. Credit 2(1-2)
(Formerly 2762)

Same as Education 533.

563. Adapted Physical Education. Credit 2(2-0)
(Formerly 2763)

Methods of examining and determining needs of the handicapped; activities suitable for individuals with abnormal body conditions, and the conduct of a program of restricted activities to meet their needs.

564. Minor Problems in Health Education and Physical Education. Credit 2(2-0)
(Formerly 2764)

This course is designed primarily for seniors to provide them with an opportunity to investigate selected professional problems.

565. Problems in Physical Education. Credit 2(2-0)
(Formerly 2765)

Special administrative problems in the organization of physical education programs and the coordination of the different phases pertinent to men and women of professional construction in the light of historical backgrounds, intramural activities, girls' athletics, athletic insurance, and athletic associations.

- 566. The Organization and Administration of Health and Physical Education.** Credit 3(3-0)
(Formerly 2766)

Philosophy and policies in the administration of a health and physical education program, including health service, healthful school living, health instruction, the classification of students, the staff, teaching loads, time schedule, finance, the gymnasium, locker-rooms, equipment, intramural and inter-scholastic athletics. (Prerequisites: 446 and permission of advisor.)

- 567. Advanced Techniques and Methods in Physical Education Activities.** Credit 1(0-2)
(Formerly 2767)

A course designed to increase skill in technique and the use of related materials in the areas of dance, sports, gymnastics, aquatics, fundamentals of marching and conditioning activities. Emphasis is placed upon the development of competency in areas of individual student weakness.

- 568. Physical Education Specialization.** Credit 1(0-2)
(Formerly 2768)

A continuation of 471. Opportunities for careful exploration in dance, aquatics, sports, gymnastics through skill improvement, independent study, field experience and special projects pertinent to the particular area of interest.

COURSES FOR ADVANCED UNDERGRADUATE AND GRADUATE STUDENTS

- 655. Current Problems and Trends in Physical Education.** Credit 3(3-0)
(Formerly 2775)

A practical course for experienced teachers. Consideration given to individual problems in physical education with analysis of present trends.

- 656. Administration of Interscholastic and Intramural Athletics.** Credit 3(3-0)
(Formerly 2776)

A study of the relation of athletics to education, and the problems of finance, facilities, scheduling eligibility, and insurance. Consideration given to the organization and administration of intramural activities in the school program.

- 657. Community Recreation.** Credit 3(3-0)
(Formerly 2777)

A study of the recreational facilities and problems with consideration being given to the promotion of effective recreational programs in rural and urban communities.

- 658. Current Theories and Practices of Teaching Sports.** Credit 3(3-0)
(Formerly 2778)

Methodology and practice at various skill levels. Emphasis placed on seasonal activity.

Recreation Courses

- 402. Field Experience I.** Credit 2(0-4)
(Formerly 2702)

Laboratory experiences during the semester in an operating recreational program.

- 408. Field Experience II.** Credit 2(0-4)
(Formerly 2708)

Practices in a second agency of Field Experience.

- 509. Field Experience III.** Credit 2(0-4)
(Formerly 2709)

Practices in a third agency of Field Experience.

- 510. Field Experience IV.** Credit 2(0-4)
(Formerly 2710)

Practices in a fourth agency of Field Experience.

- 112. Summer Field Experience.** Credit 6(0-6)
(Formerly 2712)

A placement program conducted in cooperation with a formal recreation agency. The student is assigned to an agency during the summer. The student is required to maintain records of daily experiences relative to organization, programs, problems, supervision, conferences and budget.

- 464. Group Leadership.** Credit 2(2-0)
(Formerly 2750)

Techniques in group dynamics and methods of developing group leadership capabilities.

- 463. Principles and Practices of Outdoor Recreation.** Credit 3(2-2)
(Formerly 2763)

Philosophy, organization, administration and laboratory experiences in outdoor recreation.

- 561. Methods of Research and Evaluation in Recreation.** Credit 3(2-2)
(Formerly 2760)

The application of methods of research and evaluation to the various problems in recreation.

- 564. Supervision of Recreation and Park Services.** Credit 3(3-0)
(Formerly 2764)

An analysis and investigation of supervision of employees involved in recreational services.

- 465. Program Planning in Recreation.** Credit 3(3-0)
(Formerly 2765)

This course is an analysis of recreation programs. Emphasis is placed on objectives, personnel and facilities.

- 466. Camp Administration.** Credit 3(3-0)
(Formerly 2766)

The organization and administration of camp activities. Programming camping activities that will apply to all ages and both sexes.

DEPARTMENT OF ADULT EDUCATION AND COMMUNITY SERVICES

B. W. HARRIS, *Chairman*

The Department of Adult Education and Community Services brings into focus the resources of the University to serve the needs of individuals, groups, institutions, agencies, and committees for educative, consultative and other related services. Organized for the expressed purpose to aid in fulfilling the University's extension function, the department has the following objectives:

The department is divided into *formal* and *informal* educational activities for adults and out-of-school youth.

Formal Activities.

The formal activities include a program of evening studies geared for those who desire to earn a bachelor's degree on a part-time student basis. (1) Students who desire to enter the Evening Program for academic credit are required to meet the same entrance requirements as regularly enrolled university student. (2) Residence credit at the undergraduate level is given for on-campus evening classes. Furthermore, courses are offered for both academic credit and non-academic credit for self-improvement. The Department also has a program of selected adult education courses of a non-credit category for adults without any special academic requirements.

Informal Services.

This part of the University's program makes available to the state a group of varying institutes, workshops, seminars, clinics, conferences, short-courses and special programs geared to meet the needs of business, industry, teachers and other vocational groups which fall into the range of available human resources among the faculty and other resource people.

DIVISION OF INDUSTRIAL EDUCATION AND TECHNOLOGY

- **DEPARTMENT OF INDUSTRIAL EDUCATION**

- **DEPARTMENT OF INDUSTRIAL TECHNOLOGY**

DIVISION OF INDUSTRIAL EDUCATION AND TECHNOLOGY

CHARLES W. PINCKNEY, *Director*

In responding to increasing interest and requests for the type of academic service embodied in the technology of modern industry the Division of Industrial Education and Technology identifies its primary function. The Division administers training programs leading to careers in teaching industrial subjects, safety and driver education and related technological-middle management positions for industry, commerce and governmental agencies. These programs provide collegiate-level preparation for a family of careers that require a common background of knowledge and understanding of modern industrial-production operations and management.

The breadth and depth of offerings by the Division accommodate maximum flexibility in choice of career preparation permitting development of the technical background necessary to many contemporary and emerging professional employment opportunities.

The Division is organized into two departments, namely industrial education and industrial technology. These departments provide respectively teacher training and preparation for industrial-technical-management careers.

Admission to the Division

The admission of students to programs offered by the Division is based upon general admission requirements of the University for collegiate-level work. Transfer students from other approved institutions, including junior colleges, may be admitted with advanced standing after having such credits earned elsewhere evaluated by our Admissions Office.

DEPARTMENT OF INDUSTRIAL EDUCATION

GEORGE C. GAIL, *Chairman*

This department offers two major undergraduate curricular for the preparation of industrial arts and vocational industrial education teachers, respectively. It also offers graduate curricular in these two fields and safety and driver education leading to the Master of Science degree. A service curriculum in Safety and Driver Education leading to teacher certification in this field is provided to interested students.

INDUSTRIAL ARTS EDUCATION

Industrial arts teachers generally work with public school and college students helping them gain a fuller understanding of various areas of industry; its materials, production methods, resulting products, and personnel.

Teaching careers in industrial arts are open to competent young men and women possessing creativeness, ingenuity and inventiveness; and who enjoy working with youth and adults. The curriculum encompasses a study of many technological areas such as manufacturing, construction, communications and transportation. More specifically; opportunities are provided for gaining experience in drafting and design, woodworking, electricity-electronics, metalworking, leathercraft, plastics, printing, photography and ceramics. In addition to acquiring knowledge of teaching techniques, industrial organizations and occupations; students are actively involved in studying, planning, organizing, constructing, experimenting, testing, servicing, and evaluating materials, processes and products of industry.

OPPORTUNITIES: Excellent employment opportunities exist for Industrial Arts teachers. The public schools and colleges of North Carolina, and other states, are in constant need of securing qualified teachers for industrial arts classes. Many opportunities also exist for industrial arts graduates to participate as instructors, supervisors, or directors in various programs of industry; government agencies; rehabilitation and manual arts therapy centers; and private, military and technical schools. Those desiring advanced training are prepared for graduate schools.

INDUSTRIAL ARTS EDUCATION CURRICULUM

Freshman Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Industrial Education 260, 261	2	2
Mechanical Engineering 101, 102	2	2
English 100, 101	3	3
Mathematics 101, 102	3	3
Biological Science 100	4	—
Physical Science 100	—	4
Physical Education	—	1
	14	15

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Industrial Education 263, 463	3	2
Industrial Education 233, 234	3	3
Industrial Technology 210, 213	4	4
Industrial Technology 230, 231	3	3
Industrial Technology 470, 471	3	3
Speech 250	—	2
	16	17

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Industrial Education 210, 211	2	2
Industrial Education 412	4	—
Industrial Education 510, 465	2	2
Psychology 320	3	—
Education 400	—	3
History 100, 101	3	3
Humanities 200, 201	3	3
Economics 301 (2840)	—	3
	17	16

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Industrial Education 462.....	2	—
Industrial Education 566.....	3	—
Psychology 436.....	3	—
Economics 501.....	3	—
Health Education 200.....	2	—
Sociology 100.....	3	—
Electives.....	—	2
Education 500.....	—	3
Education 560.....	—	6
	<hr/> 18	<hr/> 11

Total 124 Hours

VOCATIONAL INDUSTRIAL EDUCATION

Since the vocational industrial education teacher works with high school students who are interested in training for a single occupation or occupational family, his professional preparation must reflect a concentration of study in his chosen occupational field. In addition to developing teaching competencies, these trainees must choose their concentrated teaching field from five options; namely: automotive industry, construction industry, drafting, electrical industries and metal industries.

A high interest in the trade or occupational family and in working with people is necessary for success as a teacher in this field. Two years of trade experience, beyond the learning period, is required of applicants to this teaching field in North Carolina.

VOCATIONAL INDUSTRIAL EDUCATION CURRICULUM**Freshman Year**

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Industrial Education 260, 261.....	2	2
Mechanical Engineering 101, 102.....	2	2
English 100, 101.....	3	3
Mathematics 111, 112.....	4	4
Biological Science 100, Physical Science 100.....	4	4
Physical Education.....	—	1
	<hr/> 15	<hr/> 16

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Industrial Education 263, 463	3	2
Industrial Technology Electricity- Electronic Elective	—	3
Industrial Technology 470	3	—
Physics 211, 212	4	4
Speech 250	—	2
Technical Electives	7	6
	17	17

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Industrial Education 462, 465	2	2
Psychology 320	3	—
Education 400	—	3
History 100, 101	3	3
Humanities 200, 201	3	3
Economics 301, 501	3	3
Technical Electives	3	3
	17	17

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Industrial Education 566	3	—
Psychology 436	3	—
Sociology 100	3	—
Health Education 200	2	—
Technical Elective	3	—
Education 500	—	3
Education 560	—	6
	14	9

Total: 124 Hours

VOCATIONAL INDUSTRIAL EDUCATION TECHNICAL OPTIONS

(Select Concentration in one of the Following Areas)

AUTOMOTIVE INDUSTRIES:

IE 233 Industrial Arts Drafting	3
IT 253 Power Technology	4

IT 254	Fuel and Electrical Systems.....	4
IT 255	Transmissions and Hydraulics System.....	4
IT 451	Internal Combustion Engines and Trans	4
IT 452	Advanced Engine Servicing.....	4

CONSTRUCTION INDUSTRIES:

IE 432	Architectural Drafting.....	3
IT 210	Wood Technology	4
IT 215	Construction Methods (Frame).....	4
IT 216	Masonry Construction (Brick).....	4
IT 217	Masonry Construction (Concrete)	4
IT 571	Heating, Ventilation and Refrigeration.....	4

DRAFTING:

IT 210	Wood Technology	4
IE 233	Industrial Arts Drafting	3
IE 234	Industrial Arts Drafting	3
IE 235	Technical Drafting	3
IE 434	Advanced Architectural Drafting	3
IE 436	Machine Design Drafting	3
IE 536	Tool and Machine Design	3

ELECTRICAL INDUSTRIES:

IE 233	Industrial Arts Drafting	3
IT 210	Wood Technology	4
IT 231	Electronics Circuits.....	3
IT 234	Electronic Instrumentation	4
IT 235	Semi-Conductor Electronics	3
IT 430	Video Electronics	4
IT 432	Electronic Communications	2

METAL INDUSTRIES:

IE 233	Industrial Arts Drafting	3
IT 210	Wood Technology	4
IT 472	Manufacturing Processes Production I.....	4
IT 473	Manufacturing Processes Production II.....	4
IT 474	Dimensional Metrology	4
IT 475	Manufacturing Processes Metallurgy	4

SAFETY AND DRIVER EDUCATION

At the undergraduate level courses necessary for teacher certification in Safety and Driver Education are offered. As presently constituted the offerings represent a service curriculum geared to meeting existing and emerging requirements for teaching in this important instructional area.

At the graduate level a program in Safety and Driver Education leading to the Master of Science degree is offered. The purpose of this program is to prepare qualified individuals as safety and driver education teachers, safety supervisors for school districts, state and federal safety personnel, research personnel, and safety specialist for industry. Moreover, this program is structured to prepare individuals for careers in the national emphasized occupational and transportation safety programs. For more details on the Masters degree program, consult the Graduate Bulletin of the University.

COURSES IN INDUSTRIAL EDUCATION**Undergraduate****CRAFTS**

- 210. Introduction to Leather Craft.** Credit 2(1-2)
(Formerly I.A. 3520)

Fundamentals of materials, tools and skills used in leather craft.

- 211. Designing, Carving and Stamping Leather Craft.** Credit 2(1-3)
(Formerly I.A. 3521)

Continuation of 210—Advanced carving and stamping.

- 218. Repair and Maintenance of Home Furniture.** Credit 2(1-3)
(Formerly I.A. 3528)

A course designed to help homemaking teachers meet specific problems in the improvement and care of home furniture. Instruction in simple upholstery techniques and other processes using tools and accessories for home repair. Finishing and refinishing wood. Students encouraged to make an effort to provide their own work projects.

- 412. Upholstery—Furniture Construction.** Credit 4(2-6)
(Formerly I.A. 3542)

Principles and techniques of webbing, springing, stuffing, padding and covering upholstered furniture. Course includes chair frame construction, principles of woodturning, wood finishing and refinishing techniques.

- 413. Woodturning.** Credit 2(1-3)
(Formerly I.A. 3543)

Spindle and face plate turning, re-chucking, plug chucking, finishing and polishing on wood lathes. Emphasis on methods and techniques of teaching woodturning.

- 415. Comprehensive Shop Projects.** Credit 2(1-3)
(Formerly I.A. 3545)

General construction, repairs, maintenance work or advanced projects involving woodturning, carving, inlaying, upholstering and wood and metal finishing, metals, electricity-electronics, graphic arts.

- 510. General Shop.** Credit 2(1-3)
(Formerly I.A. 3560)

Purpose and organization of general shops, instructional materials and procedures. Shop operating problems including personnel organization and equipment selection, project construction on a general shop basis.

GRAPHIC ARTS

- 230. Introduction to Photography.** Credit 3(1-5)
(Formerly 4406)

This course is designed to acquaint the beginner with the fundamental processes of photography. Training is given in the nomenclature, operation and maintenance of various cameras—the use of exposure meters—film development—contact printing and enlarging—preparation and storage of chemical solutions. Students are encouraged to provide their own cameras.

231. Advanced Photography. Credit 3(1-5)
(Formerly 4406)

This course is a continuation of 230. Emphasis is given to larger cameras—studio lighting—portraiture—copying—refinement of darkroom techniques—spotting of negatives and prints—selection of chemicals and papers. Students who successfully complete both 230 and 231 are entitled to a certificate of proficiency.

233. Industrial Arts Drafting. Credit 3(1-5)
(Formerly I.A. 3526)

A course for acquisition of information and development of skills needed by teachers of drafting. Instruction in A.S.A. conventions, projections, revolutions, developments, lettering and pictorial representation with reference to machine, furniture drawing, sheetmetal drawing, shading, technical sketching, production illustration and industrial arts design. Prerequisite: Mechanical Engineering 102.

234. Industrial Arts Drafting Credit 3(1-5)
(Formerly I.A. 3527)

Continuation of I.A. 3526, including, basic elements in the planning and construction of residential buildings. Problems in floor plans, elevations, details and perspective. Study of kitchen, living room, dining room, bathroom and bedroom design. Prerequisite: Industrial Arts 233.

235. Technical Drafting. Credit 3(1-5)
(Formerly 4321)

Problems involving maps, charts, graphs and electrical drawings. Emphasis on drawings used in design, construction, installation, and maintenance of electrical-electronic equipment; schematic, single line, connection and interconnection diagrams; chassis layout, printed circuits, electrical codes and standards. Introduction to aircraft and marine drafting.

430. Technical Illustrations and Design. Credit 3(1-5)
(Formerly 4300)

Survey of design principles, practices and literature. Axonometric illustration, templates, overlays, bisuals, perspectives, air brush.

432. Architectural Drafting. Credit 3(1-5)
(Formerly 4320)

Planning residential structures. Construction and design principles floor, plot, heating electrical, plumbing plans; elevations, sections, details and perspectives. F.H.A. standards, building codes, cost estimates. Problems selected to meet individual needs.

434. Advanced Architectural Drafting. Credit 3(1-5)
(Formerly 4340)

Planning industrial, commercial and public buildings. Construction and design principles, materials, specifications and codes; complete plans including: plot, landscaping, framing, electrical and mechanical equipment; structural details; reinforced concrete, timber and steel. Advanced perspective rendering, analytical study of historical and contemporary architecture; materials, methods and engineering.

435. Architectural Design. Credit 3(1-5)
(Formerly 4301)

Planning and structural problems of buildings and their relationship to other buildings and space. Studies of urban and rural planning; consideration of interior planning, landscape, townscape, projects carried to working detail.

436. Machine Design Drafting.
(Formerly 4341)

Credit 3(1-5)

Advanced machine drawing; dimensions, analysis of motion, motion diagrams. Motion layout of threads; spur, bevel, worm gears and cams. Forging, pattern, piping, welding, structural practice, nomography; auxiliary views, revolutions, pictorial views. A.S.A., S.A.E., Aerospace standards.

536. Tool and Machine Design.
(Formerly 4360)

Credit 3(1-5)

Fundamentals of tool design, cutting tools, punches and die design, gage design, jigs and fixtures; indexing and coding procedures. Design, assembly and detail drawings of machines, tools and parts.

DRIVER AND SAFETY EDUCATION

253. Driver Education and Traffic Safety.
(Formerly 4123)

Credit 3(2-2)

To train students who may wish to teach driver education in the public schools. Emphasis will be placed on the objective and scope of driver education, traffic laws, preventive maintenance, skill developing exercises and aids to teaching.

555. Shop Safety Education.
(Formerly I.E. 3565)

Credit 2(2-0)

This course provides the necessary lesson units and methods of teaching school shop safety, as well as plans for developing complete shop safety education programs.

PROFESSIONAL

260. Foundations of Industrial Education.
(Formerly I.E. 3530)

Credit 2(2-0)

An orientation course in industrial education. Course requirements program operation, regulation. Familiarize the student with the underlying philosophy, basic principles, and history of industrial arts and vocational education.

261. Vocational Industrial Education
(Formerly I.E. 3531)

Credit 2(2-0)

Planning, organizing, administering, supervising, evaluating and interpreting trade and industrial education programs. Special consideration given to organization and responsibilities of local, state and national agencies.

263. Modern Industry.
(Formerly I.E. 3550)

Credit 3(3-0)

A study of the function, organization, materials, and processes of industry, for interpretation of industry in secondary school industrial education programs.

462. School Shop Design & Management.
(Formerly I.E. 3552)

Credit 2(2-0)

An analysis of general education and industrial education programs and objectives. Emphasis on planning and designing shops, equipment selection and specifications, shop management, maintenance and safety.

- 463. Vocation Guidance.** Credit 2(2-0)
(Formerly I.E. 3553)

Principles and techniques of guidance and counseling in junior and senior high schools. With emphasis on the study of industrial occupations and guidance as it relates to industrial education classes.

- 465. Instructional Analysis Techniques.** Credit 2(2-0)
(Formerly I.E. 3555)

Methods of analyzing occupations for the purpose of securing teaching content and determining instructional order. Trade elements analyzed for instructional content. Methods of developing elements into courses and preparation of instructional materials. Prerequisite: 463.

- 566. Methods of Teaching Industrial Education.** Credit 3(3-0)
(Formerly I.E. 3566)

Methods of presenting related information, procedures in giving demonstrations with tools and machines, testing and grading shop work, course of study construction, and lesson planning. Prerequisites: I.E. 462, 463, 465.

Observation and Student Teaching—See Education 560.

Advanced Undergraduate and Graduate

COURSES IN INDUSTRIAL EDUCATION

- 616. Plastic Craft.** Credit 3(2-2)
(Formerly I.A. 3576)

For teachers of industrial arts, arts and crafts, and those interested in plastics as a hobby. Operations in plastics analyzed and demonstrated; design, color, kinds and uses of plastics, how plastics are made and sold; vocational information. Projects suitable for class use constructed.

- 617. General Crafts.** Credit 3(2-2)
(Formerly 3577)

Principles and techniques of crafts used in school activity programs. Emphasis on materials, tools, and processes used in elementary schools and industrial arts courses. Open to all persons interested in craft instruction for professional or non-professional use.

- 618. Elementary School Industrial Education Programs.** Credit 3(3-0)
(Formerly 3586)

Aims, content, equipment, and methods utilized in programs designed to integrate K-6 elementary school activities with the study of industry and technology.

- 635. Graphic Arts.** Credit 3(2-2)
(Formerly I.E. 3575)

Fundamentals of typography, hand composition, press operation, block printing, silk screen techniques, and other reproduction methods, and book-binding.

- 660. Industrial Cooperative Programs.** Credit 3(3-0)
(Formerly I.E. 3579)

For prospective teachers of vocational education. Principles, organization and administration of industrial cooperative training programs.

- 661. Organization of Related Study Materials.** Credit 3(3-0)
(Formerly I.E. 3580)

Principles of scheduling and planning pupil's course and work experiences, selecting and organizing related instructional materials in I.C.T. Programs. Prerequisite: I.E. 660.

- 662. Teaching Problems in Industrial Education.** Credit 3(3-0)
(Formerly I.E. 3581)

Problems involve objectives, curriculum content, text and reference books, teaching aids, class organization and administration, safety programs, teaching techniques and plans, remedial instructions, industry and community relations. Prerequisites: I.E. 462, 465.

- 663. History and Philosophy of Industrial Education.** Credit 3(3-0)
(Formerly I.E. 3582)

Chronological and philosophical development of industrial education with special emphasis on its growth and function in American schools.

Advanced Undergraduate and Graduate

COURSES IN SAFETY AND DRIVER EDUCATION

- 651. Driver Ed. and Teacher Training.** Credit 3(2-2)
(Formerly 4143)

This course provides the student with the necessary preparation to administer the in-car phase of high school driver education. Special attention will be given to methods of developing safe driving skills and habits.

- 652. Advanced Driver Education and Teacher Training** Credit 3(2-2)

Advanced professional preparation in teaching driver education. Laboratory experiences with the multiple car range and driving simulator. Prerequisite: S. D. Ed. 651 or its equivalent.

- 653. Driver Education and General Safety** Credit 3(3-3)

Designed to present facts and information concerning the cost, in money and human suffering, of accidents in the home, industry, school, and transportation. Included is the establishment of knowledge and background conducive to the development of personal activities and practices which reduce accidents.

- 655. Automotive Technology for Safety and Driver Education** Credit 3(3-0)

A study of the functional systems of the automobiles as they relate to traffic safety.

GRADUATE

COURSES IN INDUSTRIAL EDUCATION

These courses are open only to graduate students. See the bulletin of the Graduate School for descriptions.

- 715. Comprehensive General Shop.** Credit 3(2-2)
(Formerly I.A. 3590)

717. Industrial Arts Problems I. (Formerly I.A. 3587)	Credit 3(3-0)
718. Industrial Arts Problems II. (Formerly I.A. 3588)	Credit 3(3-0)
719. Advanced Furniture Design and Construction. (Formerly 3589)	Credit 3(2-2)
731. Advanced Drafting Techniques. (Formerly I.A. 3591)	Credit 3(2-2)
762. Construction and Use of Instructional Aids. (Formerly I.A. 3592)	Credit 3(2-2)
763. General Industrial Education Programs. (Formerly I.E. 3593)	Credit 3(3-0)
764. Supervision and Administration of Industrial Education. (Formerly I.E. 3594)	Credit 3(3-0)
765. Testing in Industrial Subjects. (Formerly I.E. 3595)	Credit 3(3-0)
766. Curriculum Laboratory in Industrial Education. (Formerly I.E. 3596)	Credit 3(3-0)
767. Research and Literature in Industrial Education. (Formerly I.E. 3597)	Credit 3(3-0)
768. Industrial Education Seminar. (Formerly I.E. 3598)	Credit 3(3-0)
769. Thesis Research in Industrial Education. (Formerly I.E. 3599)	Credit 3 hrs.

GRADUATE COURSES IN SAFETY AND DRIVER EDUCATION

750. Innovations in Safety and Driver Education Workshop or institute dealing with contemporary problems and methods in safety and driver education.	Credit 3(3-0)
751. Psychological Factors in Safety and Driver Education A study of psychological variables influencing the driver's behavior. Emphasis on emotional, attitudinal, psychophysical, and social characteristics prevalent in the traffic scene.	Credit 3(3-0)
752. Alcohol and Safety and Driver Education Consideration of the psychological and physical aspects of alcohol and its resulting problems on the traffic scene.	Credit 3(3-0)
755. Multimedia and Driver Education Principles and theory of multi-media communications. Planning, utilization, and production of materials. Current trends and survey of literature in multi-media as related to Safety and Driver Education.	Credit 3(3-0)
756. Seminar in Safety and Driver Education Presentation and consideration of safety and traffic education research, issues and problems. Relationships within school, community and related agencies.	Credit 3(3-0)

757. Administration and Supervision of Safety and Driver Education

Credit 3(3-0)

Organization, administration, and supervision of safety and driver education programs. Methods of organization, techniques, materials, program planning, records and reports, financing and insurance, procurement, personnel selection, planning and securing facilities.

758. Independent Project in Safety and Driver Education

Credit 3(1-3)

Study on an individual or group basis in the field of safety and driver education. In consultation with an advisor.

759. Thesis Research

Credit 3(3-0)

DEPARTMENT OF INDUSTRIAL TECHNOLOGY

ANDREW W. WILLIAMS, *Chairman*

The department offers one baccalaureate degree program with four options in major technology areas. The Bachelor of Science in Industrial Technology embodies a curriculum to select and prepare technologists for specialization and professional responsibilities in the technical-management phase of industry. The principal curriculum areas of the degree are as follows:

1. Major Technology (Option)
2. Physical Science
3. Business Management
4. General Education

The major technology option is chosen from construction, electronics, engine power or manufacturing and prepares the student for specialization in the chosen field of industry. A good foundation in the physical sciences and mathematics establishes a base upon which continued study and educational advancement may be built. Study in the area of business management affords the students opportunities for advancement in the managerial and supervisory concomitants of his chosen technical option. The general education requirements aid the student in the cultural and social maturity providing a basis for understanding and performing his role in society.

ADVANCED STANDING GRANTED A. S. DEGREE HOLDERS

Graduates of Technical Institutes and Community Colleges who have earned the Associate in Science Degree in the following areas may be admitted to the Industrial Technology programs as juniors: Civil Engineering, Electrical Engineering, Electronics Engineering, Manufacturing Engineering, Mechanical Engineering and Mechanical Drafting and Design. (Graduates of other Technologies are invited to submit their credits for consideration). Specific course requirements for these students will have to be made on an individual basis after their previously earned credits have been assessed. The typical student in this program will be required to take at least 62 additional semester hours. In effect such students will be engaged in a 2 + 2 year program culminating in earning the B.S. degree here.

Graduates of our Industrial Technology program have been among the most sought after alumni of our University in recent years and are holding responsible positions within this country and abroad.

DEPARTMENTAL OBJECTIVES

The objectives of the Department of Industrial Technology are as follows:

1. To develop an understanding of industry and methods of production and the influence of industrial products and services upon the pattern of modern social and economic life.
2. To develop an appreciation of good design and workmanship in their application to construction and to manufactured products.
3. To experience a challenging program of instructional activities designed to meet the requirements of employment in modern technology, including science and business management.
4. To acquire a high degree of competence in his chosen technical elective.

INDUSTRIAL TECHNOLOGY CURRICULUM**Freshman Year**

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
English 100, 101 (2401, 2402)	3	3
Mathematics 111, 112 (3611, 3613)	4	4
Phy. Science 100, Bio. Science 100 (1601, 1501)*	4	4
M. E. 101, 102 (3701, 3702)	2	2
Ind. Technology 271, 272 (4501, 4502)	2	2
	<hr/> 15	<hr/> 15

Sophomore Year

History 100, 101 (2800, 2801)	3	3
I. T. 210 (I.A. 3522)	4	<hr/> 4
I. T. 253 (4113)	<hr/> 3	3
Drafting Electives	3	3
Physics 211, 212	4	4
Humanities 200, 201 (2434, 2435)	3	3
	<hr/> 17	<hr/> 17

Junior Year

Health Education 200 (2700)	2	<hr/>
Mathematics 240 (3641)	3	<hr/>
Ind. Ed. 263, (3550)	<hr/>	3
Speech 250 (2425)	<hr/>	2
Accounting 221**	<hr/>	3
Ind. Tech. 230 (I.A. 3540)	3	<hr/>
Technical Electives	4	4
B. A. 304	<hr/>	3
Elective	3	<hr/>
	<hr/> 15	<hr/> 15

* Chemistry 100 (1611), 101 (1612) may be substituted for Bio Science and Physical Science.

** The business courses listed in the Junior and Senior year are recommended. Other business or Economic courses may be acceptable.

Senior Year

Ind. Tech. 476 (4142)	2	—
Ind. Tech. 411 or M. E. 339.	—	2
Psychology 320	3	—
B. A. 305, 569***	3	3
Ind. Tech. 575 (4242)	2	—
Ind. Ed. 555 (3565)	—	2
Technical Electives	4	4
Electives	—	3
	14	14

TOTAL: 124 Semester Hours

TYPICAL 2 YEAR CURRICULUM IN INDUSTRIAL TECHNOLOGY FOR ASSOCIATE IN SCIENCE GRADUATES

NOTE: First two years of academic credits earned at Technical Institutes or Community Colleges.

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Phy. Sci. 100, Bio. Sci. 100	4	4
Soc. Sci. 100, 101 Western Civilization I & II	3	—
Tech. Electives (Breadth Courses)*	4	4
Humanities 200, 201	3	3
Mathematics 240 (Computer Science)	—	3
Health Education 200 Personal Hygiene	2	—
	16	17

Senior Year

Accounting 221 Principles of Accounting	3	—
Ind. Ed. 263 Modern Industry	—	3
I.T. 411 or M.E. 339 Contracts & Specifications	—	2
I.T. 476 Industrial Plant Planning and Management	2	—
Psychology 320, 445 (or B.A. 569)	3	3
B.A. 304, 305 Intro. to Business & Prin. of Mgt.	3	3
Ind. Ed. 555, Safety Education	3	—
Electives	2	2
	16	13

TOTAL: 62 Semester Hours

*** Psychology 445 may be substituted.
NOTE: Military or Air Science is optional.
* To be selected from courses in Construction, Engine Power, Electronics or Manufacturing where prior credits have not been earned.

COURSES FROM WHICH TECHNICAL OPTIONS MAY BE CHOSEN

(Minimum 16 semester credit hours from one of the options listed below)

	Semester <i>Credit Hours</i>
CONSTRUCTION:	
215 Construction Methods	4
216 Masonry Construction (Brick)	4
217 Masonry Construction (Concrete)	4
412 Mechanical Equipment for Buildings	2
413 Building Construction and Allied Fields	4
414 Exterior and Interior Finishing	4
571 Basic Refrigeration Principles	4
ELECTRONICS:	
231 Electronic Circuits	3
234 Electronic Instrumentation	4
235 Semi-Conductor Electronics	3
430 Video Electronics	4
431 Electronic Amplifiers	2
432 Electric Communication	2
433 Electronic Controls	3
434 Industrial Electronics	4
571 Basic Refrigeration Principles	4
ENGINE POWER:	
254 Automotive Engine Technology	4
255 Power Trains and Hydraulics Systems	4
451 Automatic Transmissions	4
452 Advanced Diagnostic Testing and Servicing	4
455 Auto Body Rebuilding and Finishing	4
571 Basic Refrigeration Principles	4
MANUFACTURING:	
472 Manufacturing Processes—Production I	4
473 Manufacturing Processes—Production II	4
474 Dimensional Metrology	4
475 Manufacturing Processes—Metallurgy	4
570 Mechanical Design and Manufacturing Problems	4
571 Basic Refrigeration Principles	4

COURSES IN INDUSTRIAL TECHNOLOGY**CONSTRUCTION****210. Wood Technology.**
(Formerly 3522)

Credit 4 (2-6)

A study of woods, forest products, tools and equipment related to the woodworking industry. Attention is given to the practical, natural and industrial characteristics of the common species of woods that make them desirable for specific manufacturing processes and products. Practicability for home consumption is also given consideration. Fastening devices and adhesives used in the assembly of wood products, as well as the various paint materials used in wood finishing are studied.

213. Wood Technology. Credit 4(2-6)
(Formerly 3523)

An advanced course in home and industrial furniture design. Attention is given to the various styles and designs of modern and period furniture. The construction and finishing, as well as the tools and equipment used are given special study.

215. Construction Methods. Credit 4(2-4)
(Formerly 4221)

Full size models of various framing sections of dwelling houses are constructed and studied, with special attention being given to building codes and zoning laws. The National Building Code is used in conjunction with textbooks covering the construction of residence foundations and framing systems. Floor framing, wall framing and estimating of materials are included.

216. Masonry Construction (Brick). Credit 4(2-4)
(Formerly 4228)

A study of brick and other masonry units used in building construction. The course covers interpreting working drawings and specifications, layout and methods of construction, and estimating. Construction supervision is also included as it relates to job production and quality workmanship.

217. Masonry Construction (Concrete). Credit 4(2-4)
(Formerly 4229)

Emphasis is placed on concrete as a building material. A study is made of the kinds, properties, and application of concrete in residential and commercial construction.

410. Human Relations. Credit 3(3-0)
(Formerly 4223)

A study of problems in the work-a-day world which will aid one in getting along with people on the job, in the community and the home. These units of work include: habits one may acquire in order to improve human relations, privileges, rights and obligations as a citizen, obtaining and holding a job, labor problems, social and commercial insurance and the use of leisure time.

411. Estimating. Credit 2(2-0)
(Formerly 4224)

Designed to give the student a practical knowledge of all phases of estimating. Included is the study of working drawings, specifications, contracts, codes and the general techniques of estimating.

412. Mechanical Equipment of Buildings. Credit 2(2-0)
(Formerly 4230)

The basic principles and advanced practices in the selection, installation, operation and maintenance of equipment in the general areas of water supply and sanitation, heating systems and electrical materials and appliances.

413. Building Construction and Allied Fields. Credit 4(2-4)
(Formerly 4234)

An introductory course covering the current practices in organizing and coordinating the different phases of building construction as a business and professional service.

414. Exterior and Interior Trim. Credit 4(2-4)
(Formerly 4240)

Study of structural and finish materials used in architectural construction, their properties and manufacture; including, theory and practice of stair construction, and methods used in exterior and interior trim of buildings.

415. Advanced Building Methods.
(Formerly 4241)

Credit 4(2-4)

The use of builder's level, staking out building sites, foundations, concrete form construction and complex layout of roofs of all types. Advanced blueprint reading, layout and estimating of buildings. Actual practice in building residential and commercial type buildings of light frame construction.

ELECTRONICS**230. Electricity and Electronics.**

Credit 3(1-5)

Types, characteristics, and operation of tubes and semi-conductors. Power supplies, detectors, amplifiers, oscillators and associated circuits. Practice in assembling and testing electrical and electronic devices.

231. Electronics Circuits.

Credit 3(1-5)

Operating principles and characteristics of communication and navigational systems. A.M., F.M., T.V., Radar, Sonar, Transmission and reception. Practice in assembling, testing and analysis of circuits. Prerequisite: I.T. 230.

233. Electric Wiring.
(Formerly 4226)

Credit 2(1-2)

The study of materials, methods and nomenclature used in residential and commercial wiring including a study of National codes, layouts, plans and specifications.

234. Electronic Instrumentation.
(Formerly 4404)

Credit 4(4-0)

This course emphasizes a variety of electronic instruments such as the V.O.M., V.T.V.M., Ohm meters, watt meters, impedance meters, inductance checkers, V.U. meters, signal generators, signal tracers, tube testers, simulators, analog computer meters, spectrophotometers and oscilloscopes. Their application to electronic analyzation and research is emphasized.

235. Semi-Conductor Electronics.
(Formerly 4405)

Credit 3(3-0)

This is a general course in transistor theory. It includes the study of semi-conductor physics, zener diodes, silicon diodes, photo-diodes, and photo-transistors as these relate to electronic circuits. Prerequisite: 231.

430. Video Electronics.
(Formerly 4421)

Credit 4(2-4)

A study of deflection signals, amplifiers, synchronization systems, integrating networks; microwave, facsimile, R.F. high voltage, pulse circuits and monochrome networks in video transmitters and receiver systems. Prerequisite: 235.

431. Electronic Amplifiers.
(Formerly 4424)

Credit 2(2-0)

The course is designed to cover audio frequencies, magnetic power amplifiers and industrial computer amplifiers in R.F., V.H.F., S.H.F., and U.H.F. systems. Prerequisite: 430.

432. Electronic Communication.
(Formerly 4446)

Credit 2(2-0)

The theory of electronics utilized in commercial communication systems with the fundamental regulation of the F.C.C. first and second class licenses with emphasis on A.M., C.B., F.M. broadcast microphone, recorders and tape machines, remote facilities, F.M. T.V. transmitters and monitors. Prerequisite: 431.

433. Electronic Control.
(Formerly 4468)

Credit 3(2-2)

A study of combined control systems utilizing A.C. and D.C. control thyratrons, three phase rectification, phase shift preaking transformers and motorspeed controls.

434. Industrial Electronics.
(Formerly 4469)

Credit 4(3-2)

A survey of industrial electronic computers, microelectronic, solid state device, servomechanism, synchros, staturable reactors, ignitrons, and frequency guidance systems.

ENGINE POWER

251. Internal Combustion Engine and Transportation.
(Formerly 4111)

Credit 2(1-3)

The history and development of the internal combustion engine and transportation with laboratory units, disassembly, assembly and study of fundamental component parts and function of the engine systems.

252. Carburetion and Ignition Maintenance.
(Formerly 4112)

Credit 2(1-3)

Principles of carburetion, composition of fuels, a study of carburetors and fuel systems, testing and adjusting carburetors and fuel pumps. The automotive electric and ignition systems. Operation, inspection and maintenance of batteries and charging system. Proper use of diagnostic equipment.

253. Power Technology.
(Formerly 4114)

Credit 4(2-4)

The study of broad basic concepts of energy converting machines and devices that man has developed in a technological culture, with emphasis on the technical complex, the human complex and the cultural complex of technology.

254. Automotive Engine Technology.
(Formerly 4114)

Credit 4(2-4)

Construction, function and principles of operation of all engine components. Functions and principles of engine operating systems.

255. Transmissions and Hydraulics Systems.
(Formerly 4121)

Credit 4(2-4)

Basic principles of heat and friction, hydraulics, levers, and gears. Power train construction, function and principles of operation. Prerequisite: 254.

451. Automatic Transmission Servicing.
(Formerly 4131)

Credit 4(2-4)

Hydraulic principles pertaining to automatic transmissions. Principles of simple, complex, and compound planetary gear trains. Nomenclature and operation of transmission components. Prerequisite: 255.

452. Advanced Diagnostic Testing and Servicing. Credit 4(2-4)
(Formerly 4132)

Major methods of diagnostic testing, trouble shooting, proper use of scientific and precision tools and equipment.

455. Auto Body Rebuilding and Finishing. Credit 4(2-4)
(Formerly 4135)

Body construction shapes, parts, panels, and methods of restoring damaged parts, and finishing procedures.

456. Auto Body Finishing. Credit 4(2-4)
(Formerly 4136)

The method and procedure of finishing the automobile. Color matching and blending.

MANUFACTURING

271. Introduction to Industrial Technology. Credit 2(2-0)
(Formerly 4501)

An introductory course to the world of modern Industrial Technology including a brief history of manufacturing processes and related technology. Occupations in Industrial Technology and educational requirements for entering and advancing in the field are covered. Emphasis will be placed on the field of electronics, manufacturing, construction and power technology.

272. Industrial Technology Processes. Credit 2(2-0)

An introduction to typical problems encountered in industrial technology operations including metal manufacturing, power technology, electronics, and construction. The use of the slide rule as an aid in problem solving is emphasized.

275. Fundamentals of Metal Joining I. Credit 2(1-4)

The basic course of theory and practice in gas welding, brazing, soldering, cutting, fundamentals of electric arc welding.

276. Fundamentals of Metal Joining II. Credit 2(1-4)
(Formerly 4506)

Continuation of 275 with emphasis on heliarc welding, spot welding, tig welding, and the latest techniques of metal joining, X-ray and testing.

470. Metal Technology. Credit 3(1-4)
(Formerly 3522)

A basic course in metal work involving planning and design and general metals including bench and sheet metal, forging and foundry, basic machine tool operations and finishing processes.

471. Metal Technology. Credit 3(1-4)
(Formerly 3525)

Advanced study of machine tool operations, heat treating, inspection and assembly.

472. Manufacturing Processes—Production I. Credit 4(2-4)

Basic manufacturing techniques with machine tools and precision measuring instruments. Emphasis is placed on the basic machine tool including the lathe milling machine and shaper. Related technical knowledge and new trends in the manufacturing process are covered including numerical control, chemical milling, etc.

473. Manufacturing Processes—Production II. Credit 4(2-4)
(Formerly 4522)

Continuation of 472 with emphasis on the major machine tools used in industry. Prerequisite: 472.

474. Dimensional Metrology. Credit 3(2-2)
(Formerly 4540)

A basic course in the history of measurement, the science of measurement and the language. Modern practices emphasized.

475. Manufacturing Processes (Metallurgy) Credit 4(3-2)
(Formerly 4541)

A basic course in metallurgy consisting of a study of raw materials, ferrous and non-ferrous metals and their manufacture. Basic applied metallurgy operations.

476. Industrial Plant Planning and Management. Credit 2(2-2)
(Formerly 4142)

The principles and techniques of plant layout as applied to modern industry. Problems involved in planning new, remodeling old, and expanding present industrial facilities that they may better serve their intended purposes. Emphasis is on the roles of management, materials and machinery.

477. Co-operative Training in Industry Credit 4

Student must be in Industry full-time for one semester in his major field of work and complete any University Co-op requirements. He will be evaluated on reports from industry and the University Co-op Coordinator. The hours earned will be credited toward required technical electives in the Industrial Technology curriculum. Four semester hours credit is the maximum to be earned under this arrangement in any one semester. Eight semester hours is the maximum to be earned in the co-op arrangement in the Industrial Technology Department.

478. Co-operative Training in Industry Credit 4

Student must be in Industry full-time for one semester in his major field of work and complete any University Co-op requirements. He will be evaluated on reports from industry and the University Co-op Coordinator. The hours earned will be credited toward required technical electives in the Industrial Technology curriculum. Four semester hours credit is the maximum to be earned under this arrangement in any one semester. Eight semester hours is the maximum to be earned in the co-op arrangement in the Industrial Technology Department.

570. Mechanical Design and Manufacturing Problems. Credit 4(2-4)
(Formerly 4560)

A basic course in mechanical design procedures and problems of manufacturing. Some recent advances are covered including critical path scheduling and machine relations. Prerequisite: 473, 475.

571. Heating, Ventilation and Refrigeration. Credit 4(2-4)
(Formerly 4561)

A study of principal equipment; design, load calculations for cooling and heating, layouts and controls employed in various types of systems. This course is augmented by a practical design problem.

- 572. Commercial Refrigeration, Heating and Ventilation.** Credit 4(2-4)
(Formerly 4562)

A study of steam systems; hot water systems; warm air systems and electrical systems used in heating buildings. Load calculation for walk-in cooler and deep freezers and drinking water fountains. Special refrigerating devices and applications.

- 573. Conditioned Air Systems I.** Credit 4(2-4)
(Formerly 4563)

A study of fundamentals involved in the conditioning of air for comfort. Sensible and latent heat transfer, states of matter and humidity.

- 574. Conditioned Air Systems II.** Credit 4(2-4)
(Formerly 4564)

Continuation of 573 with emphasis on controls, heat loads and special types of systems.

- 575. Mechanics of Materials.** Credit 2(0-4)
(Formerly 4242)

A study of physical properties of common materials of industry. Simple stresses, loads, yield strength, ultimate strength, and factors of safety. Applications are made in the areas of riveted and welded joints, pressure vessels, and beam design.

- 576. Independent Study** Credit 3(0-6)

The student selects a technical problem in his major area for special research and study in consultation with a faculty member in his area of interest. He will spend a minimum of 6 hours per week in library research or laboratory experimentation. A technical report in standard format will be required for completion and must be approved by two department faculty members. Prerequisites: Junior or Senior Status.

Advanced Undergraduate and Graduate

- 673. Advanced General Metals I.** Credit 3(2-2)
(Formerly 3573)

A course in metalwork for teachers of industrial arts. Emphasis will center on art metal (including plating, finishes, etc.), advanced bench metal, sheet metal operations and machine shop. Specifications for equipment, organization of instruction sheets, special problems and materials will be covered as well as shop organization. Prerequisite: 471.

- 674. Advanced General Metals II.** Credit 3(2-2)
(Formerly 3574)

An advanced course in metalwork for the industrial arts teacher or other persons who may require more specialization in one area of metalwork. With the necessary prerequisites, the student may select any area of general metals for concentration and special study. Construction of projects, special assignments, etc. will be made after the area of work is selected and after consultation with the instructor. Prerequisite: 673.

For Graduates Only

- 651. Power Industries and Technology.** Credit 3(2-2)

Significance of modern power sources in Industrial Technology. Design and operating principles of steam, water, hydraulic, pneumatic, internal and external combustion

units. Nuclear, hydro-electric, gasoline, diesel, turbine rocket, jet, fuel cells, solar energy and other systems. Laboratory experiences involving utilization of power equipment, testing and servicing, with major emphasis on portable power plants.

735. Electricity-Electronics.
(Formerly 3585)

Credit 3(2-2)

For teachers and prospective teacher of Industrial Arts. Emphasis placed on selection and construction of projects useful in school shops, development of selected information. Selecting equipment and supplies, course organization and instructional materials.

SCHOOL OF ENGINEERING



SCHOOL OF ENGINEERING

REGINALD AMORY, *Dean*

The School of Engineering grants Engineers' Council for Professional Development (ECPD) accredited bachelor of science degrees in architectural, electrical, and mechanical engineering. The School also grants bachelor of science degrees in engineering mathematics and engineering physics in cooperation with the Departments of Mathematics and Physics.

The curricula offerings include a five-year program in architectural engineering and four year programs in each of the other engineering disciplines.

The programs of study are aimed toward preparing a student for engineering practice in all phases of his chosen field. The specific objectives of the School of Engineering are:

1. To prepare the student for an active career in all facets of professional engineering.
2. To provide a comprehensive background in all phases of the engineering design process, namely: conception, planning, synthesis, analysis, design, and management.
3. To provide a basic knowledge of the mathematical and natural sciences upon which the practice of professional engineering depends.
4. To develop the judgment the engineer requires to effectively utilize, economically, the materials and forces of nature for the benefit of mankind.
5. To encourage the student to develop an appreciation for the process of continuing education.
6. To develop the intellectual, professional, and social characteristics of the student in such a manner as to enable him to become a responsible leader in his community.

ADMISSION TO THE SCHOOL OF ENGINEERING

The admission requirements are generally the same as those required for entrance as a freshman student. However, two units of algebra, one unit of plane geometry, and one-half unit of trigonometry are required for students who elect to pursue engineering curricula.

COOPERATIVE EDUCATION PROGRAM

A five-year cooperative program, in which students may earn a major portion of their educational expenses through a work-study arrangement with industry, is available to students with satisfactory scholastic records.

After satisfactory completion of at least two semesters in the freshman year, students in engineering, mathematics or physics may alternate semesters in industry with semesters at the university until their senior year. They then remain at the university until graduation. This arrangement enables the student to receive two years of work experience and at the same time earn educational expenses.

Department of Architectural Engineering

WILLIAM A. STREAT, JR., *Chairman*

It is the aim of the program in architectural engineering to encourage and develop students, who exhibit creative ability and who exhibit the ability to grasp and use

scientific principles, for professional careers in the art and science of building. Strong emphasis is placed on training in the building sciences and on training in engineering as it applies to the design and construction of buildings.

The architectural engineering program provides considerable training in general education which is devoted to study of social and physical sciences, art, English, mathematics and the humanities. Introductory courses in architectural engineering and a large percentage of the required general education courses are scheduled in the freshman and sophomore years. This training, during the first and second years, provides background for the study of basic engineering science and the study of more professional courses which are scheduled later in the program. Instruction within the department of architectural engineering is organized under four divisions.

1. Graphics, Architectural Design and Architectural History.
2. Environmental Control, Electrical and Mechanical Equipment of Buildings.
3. Professional Practice, Management, Materials and Methods of Construction.
4. Structures.

Each of these divisions has specific course requirements that are aimed toward the development of the architectural engineering student so that he will be able to take his place in society as a professional in the field of engineering.

The five year program in architectural engineering leads to the bachelor of science degree and is fully accredited by the Engineer's Council for Professional Development.

PROGRAM IN ARCHITECTURAL ENGINEERING

Freshman

<i>Course and Number</i>		<i>Fall Semester Cr.</i>	<i>Spring Semester Cr.</i>
Architectural Engineering	111, 112	1	1
Chemistry	101	3	
Chemistry	111	1	
English	100, 101	3	3
Mathematics	116, 117	5	5
History	100	3	
Physics	221		5
Geology	309		
		<hr/> 16	<hr/> 17

Sophomore

<i>Course and Number</i>		<i>Fall Semester Cr.</i>	<i>Spring Semester Cr.</i>
Architectural Engineering	321, 322	3	3
Art	220, 221	2	2
History	101	3	
Physics	222	5	
Mathematics	300	4	
Humanities	200		3
Mechanical Engineering	335		3
Mechanical Engineering	200		3
Electives			2
		<hr/> 17	<hr/> 16

Lower Junior

<i>Course and Number</i>	<i>Fall Semester Cr.</i>	<i>Spring Semester Cr.</i>
Architectural Engineering 441, 442	4	4
Architectural Engineering 443, 444	3	3
Architectural Engineering 445		3
Architectural Engineering 448		2
Architectural Engineering 449	3	
Architectural Engineering 446, 447	2	2
Humanities 201		3
Mechanical Engineering 336	4	
	<hr/> 16	<hr/> 17

Upper Junior

<i>Course and Number</i>	<i>Fall Semester Cr.</i>	<i>Spring Semester Cr.</i>
Architectural Engineering 451	4	
Architectural Engineering 453	2	
Architectural Engineering 454, 455	3	2
Architectural Engineering 456, 457	3	3
Architectural Engineering 458		3
Mathematics 240		3
Mechanical Engineering 337		3
Mechanical Engineering 441		3
Electives	4	
	<hr/> 16	<hr/> 17

Senior

<i>Course and Number</i>	<i>Fall Semester Cr.</i>	<i>Spring Semester Cr.</i>
Architectural Engineering 561, 562	4	4
Architectural Engineering 563, 564	3	3
Architectural Engineering 565		2
Economics 301	3	
Mechanical Engineering 561, 443	4	3
Mechanical Engineering 300		2
Electives	3	
	<hr/> 17	<hr/> 14

NOTE: Architectural Engineering students may elect Chemistry 102 and 112 in the Second Semester of their freshman year, instead of Geology 309. The additional one semester hour credit will be used to satisfy elective requirements.

Freshman	—	34
Sophomore	—	33
Lower Junior	—	33
Upper Junior	—	33
Senior	—	31

Courses in Architectural Engineering**Undergraduate****111. Architectural Orientation** Credit 1(1-0)

Lecture, Seminar Course: Orientation to the University and the department of architectural engineering. Presentation of selected topics, student participation and discussions.

112. Architectural Seminar I Credit 1(1-0)

Lecture, Seminar, and Laboratory Demonstration: An analysis of architectural engineering-preparation, opportunities and professional contributions. Selected lectures and laboratory demonstrations are provided. Individual and group participation of students are encouraged. Prerequisite: Architectural Engineering 311 or consent of the department.

321. Architectural Graphics I. Credit 3(0-6)
(Formerly A. E. 3121)

Orientation to architecture, the use and care of drafting instruments, line and lettering techniques, orthographic and auxiliary projections, surface intersections and development, oblique and isometric drawing. Prerequisites: Plane and Solid Geometry. (Not open to entering freshmen—open only to majors in architectural engineering).

322. Architectural Graphics II. Credit 3(0-6)
(Formerly A. E. 3122)

Laboratory-lecture course. Shades and shadows, perspective drawing, study of the architectural plan, elevation and section, architectural presentation studies in pencil, pen and ink and water color. Prerequisite: Architectural Engineering 321.

441. Architectural Design I. Credit 4(0-8)
(Formerly A. E. 3141)

Laboratory-lecture course. Designed to introduce the basic fundamentals of design, and as they are applied to architecture; influences on architecture, space relationships, form and visible structure. A series of problems is presented in the design of buildings having simple requirements. Prerequisite: Architectural Engineering 322.

442. Architectural Design II. Credit 4(0-8)
(Formerly A. E. 3142)

Laboratory-lecture course. Presenting a series of problems in space organization and planning with the study of composition and structure. Prerequisite: Architectural Engineering 441.

443. History of Architecture I. Credit 3(3-0)
(Formerly A. E. 3143)

Illustrated lecture. The early architecture and civilizations of Egypt, Western Asia, Greece and Italy; architectural developments by the Early Christian and Byzantine builders, and a beginning study of the architecture and civilizations of the Medieval period. Prerequisites: Architectural Engineering 322, and Humanities 200.

444. History of Architecture II. Credit 3(3-0)
(Formerly A. E. 3144)

Illustrated lecture. The architecture and civilizations of the Medieval period, and the architecture and civilizations of the Renaissance and of the early Americas. Prerequisite: Architectural Engineering 443.

445. Graphic Statics. Credit 3(1-4)
(Formerly A. E. 3145)

Lectures and laboratory work. Graphical analysis of forces, truss stresses, moments of inertia, centroids, shears, bending moments and deflections. Forces on masonry structures, kerns, pressures and bending theory. Applications to the design of simple structural elements. Prerequisite: Mechanical Engineering 335.

446. Materials and Methods of Architectural Construction I. Credit 2(2-0)
(Formerly A. E. 3146)

Lecture. The manufacture and use of materials for wood frame and masonry construction. The study of construction methods and the influence of building codes. Prerequisite: Architectural Engineering 322.

447. Materials and Methods of Architectural Construction II. Credit 2(2-0)
(Formerly A. E. 3147)

Lecture. The manufacture and use of materials for fire resistive construction. The study of construction methods and the influence of building codes. Prerequisite: Architectural Engineering 446.

448. Building Sanitation. Credit 2(2-0)
(Formerly A. E. 3148)

Lecture-problems course. Basic Hydrostatics and Hydrodynamics. Liquid flow in pipes. Building equipment and services including water supply and distribution, fire protection, plumbing, sanitary drainage and sewage disposal. Prerequisite: Junior Classification.

449. Electrical Equipment of Buildings. Credit 3(3-0)
(Formerly A. E. 3149)

Lecture-problems course. Characteristics of electrical distribution systems, computation of electrical power requirements for buildings, theory and design of wiring systems and lighting systems for buildings, and the selection of electrical equipment for buildings. Prerequisites: Physics 222, Junior Classification.

451. Architectural Design III. Credit 4(0-8)
(Formerly A. E. 3151)

Laboratory-lecture course presenting a series of problems for study of space analysis, space organization, form and function. Integration of design and construction methods and the organization of structural components. Prerequisite: Architectural Engineering 442.

452. Architectural Design IV. Credit 4(0-8)
(Formerly A. E. 3152)

Laboratory-lecture course presenting a series of problems in the design, analysis, and organization of buildings. Economic and social considerations are given to problems.

Group planning, mass and orientation are studied for more complex building requirements. More detailed study and presentation is required to emphasize the complete architectural complex. Prerequisite: Architectural Engineering 451.

453. History of Architecture III. Credit 2(2-0)
(Formerly A. E. 3153)

Illustrated lecture. An analytical study of Modern and Contemporary Architecture. Prerequisite: Architectural Engineering 444.

454. Reinforced Concrete Theory I. Credit 3(3-0)
(Formerly A. E. 3154)

Lecture-problems course. Reinforced concrete theory as applied to building structures. Theory of design for beams, slabs, and columns. Allowable stress and ultimate strength concepts. Bending of reinforced concrete columns. Prerequisites: Architectural Engineering 445, Mechanical Engineering 336.

455. Reinforced Concrete Theory II. Credit 2(2-0)
(Formerly A. E. 3155)

Lecture-problems courses. Footings and retaining walls, theory of design for continuous reinforced concrete beams and slabs. Prerequisite: Architectural Engineering 454.

456. Theory of Structures I. Credit 3(3-0)
(Formerly A. E. 3156)

Lecture problems course. Reactions, shears and moments, truss analysis, influence lines and criteria for maximum moving load conditions. Introduction to space frames. Portal and cantilaver approximate methods of analysis. Moment area theorms and deflections. Prerequisites: Architectural Engineering 445, Mechanical Engineering 336.

457. Theory of Structures II. Credit 3(3-0)
(Formerly A. E. 3157)

Lecture problems course. Elastic weights and the conjugate beam. Virtual work solutions, Maxwell's Law and Williot-Mohr methods of analysis. Analysis of statically indeterminate problems by consistent deformation, fixed points, Castigliano's theorems, three moment equations, slope deflection, moment distribution, and column analogy. Introduction to the theory of limit design for Steel Plastic analysis and analysis adaptable for computer solutions. Prerequisite: Architectural Engineering 456.

458. Production Drawings. Credit 3(0-6)
(Formerly A. E. 3158)

Laboratory Course: Preparation of architectural working drawings and details for buildings. Prerequisites: Architectural Engineering 442, 447.

561. Structures I. Credit 4(2-4)
(Formerly A. E. 3161)

Lecture and Laboratory: Theory and design of structural components: tension members, compression members and beams. Connections—Design of statically determinate systems. Prerequisite: Architectural Engineering 456.

562. Structures II. Credit 4(2-4)
(Formerly A. E. 3162)

Lecture and Laboratory: Multistory frames: gravity and lateral loads. Design of building frames. Limit design. Three hinged arches. Composite construction. Prerequisite: Architectural Engineering 561.

563. Statically Indeterminate Structures.

Credit 3(3-0)

(Formerly A. E. 3163)

Lecture. Analysis of continuous beams and rigid frames. Approximate methods and special techniques: slope deflection, moment distribution, column analogy. Introduction to design of statically indeterminate systems. Prerequisite: Architectural Engineering 455, 457.

564. Foundation and Soil Structures.

Credit 3(1-4)

(Formerly A.E. 3164)

Lecture and Laboratory: Origin and composition of soils, soil structure. Flow of water through soils, capillary and osmotic phenomena. Soil behavior under stress; compressibility; shear strength. Elements of mechanics of soil masses with application to problems of bearing capacity of foundations, earth pressure on retaining walls, and stability of slopes. Prerequisite: Upper Junior Classification.

565. Professional Practice.

Credit 2(2-0)

(Formerly A. E. 3165)

Lecture. Procedures of professional practice, registration, ethics, professional services, contracts, bonds, liens, insurances, bidding procedures, supervision, and administration of construction operations, office management and accounting. Prerequisite: Upper Junior Classification. For majors in architectural engineering only.

566. City Planning and Urban Design I.

Credit 4(2-4)

Lecture and Laboratory Course: History of city planning and urban design; general problems of city planning and urban design-Architectural space composition. Theory of space composition. Regional and urban planning; Scale of the plan for region and city. Transportation in the city; the City as a human unit. Greenery in the city. Location of the residential areas, industry, business and commerce, etc. Location criteria. Design of the neighborhood unit. Prerequisites: Juniors enrolled in the program of the unit. Prerequisites: Juniors enrolled in the program of the Transportation Institute and Architectural Engineering majors of junior classification. Open to practicing design professionals.

567. City Planning and Urban Design II

Credit 5(2-6)

Lecture and Laboratory Course: New outlooks on the city and the city planning process. High-rise and flat cities, low-rise housing in the city. Space compositional factors. Places of public interest. Places of aesthetical attraction in the city. Transportation, and extension of the city. Types of housing such as row housing, twin housing, etc. High-rise city (high-flat housing); density of population, and scale of the city. Plans for high-rise housing, low income housing, and industrialized technology in low income housing. Design of the city plan. Cooperation with the transportation engineer, economist, sociologist, etc. Prerequisites: Architectural Engineering 566 and 442. Open to practicing design professionals.

DEPARTMENT OF ELECTRICAL ENGINEERING

ARMAND RICHARDSON, *Chairman*

Electricity is the most flexible form of energy available to man, and the Electrical Engineer deals with all applications of electrical energy. He designs and oversees the

construction, the installation and the maintenance of electric systems—for cities and industry, for town and farm—that provide light and heat and power. He develops communication systems of radar and radio, television, telephone and telegraph. He designs and automates control systems for factories and business, for trains, planes and space vehicles. He creates test and measurement devices for every area of the physical sciences, biological sciences and medicine. He develops new uses of electricity faster than the single mind can comprehend them.

The programs offered by the Department of Electrical Engineering are carefully designed to give the basic principles of the social science and humanities as well as the engineering and physical sciences. Technical electives allow some specialization in digital systems, electronics, communications and controls. Upon completion of the program the student should have:

1. Learned the methods of critical inquiry and developed the use of the main tools of thought and expression in our society.
2. Acquired an understanding of and appreciation for the arts and sciences of man, including an understanding of the social and physical environment in which he lives.
3. Developed competence in his chosen vocation, profession, or field of concentration.
4. Developed civic consciousness to the extent that he is ready to assume fully the responsibilities of citizenship and willing to participate in the solutions of local, national, and international problems.
5. Developed the power of independent thinking, critical judgment, self-control, integrity, dignity, moral stability, and individual initiative.
6. Developed understandings, attitudes, and skills essential to the maintenance of health, including appreciation for a variety of wholesome leisure time pursuits.
7. Acquired a sense of identity, aspiration, an achievement and a desire for continuing education.

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING SUGGESTED SEQUENCE OF COURSES

Freshman Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
✓Electrical Engineering 100, 101	4	4
✓English 100, 101	3	3
✓Chemistry 100	3	—
✓Chemistry 111	1	—
✓Mathematics 116, 117	5	5
✓Physics 221	—	5
	16	17

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Electrical Engineering 325	—	3
Electrical Engineering 337	—	4
Physics 222	5	—
Mathematics 300, 500	4	4
Mechanical Engineering 335, 361	3	3
History 100	3	—
†Electives.	3	3
	—	—
	18	17

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Electrical Engineering 448, 501	4	3
Electrical Engineering 450, 452	3	4
Mechanical Engineering 441, 337	3	3
*Physics 406	3	—
Electives.	3	6
	—	—
	16	16

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Electrical Engineering 565	4	—
Electrical Engineering 570	4	—
Senior Seminar 575	1	—
Electives.	5	14
	—	—
	14	14

† Thirty-four (34) hours of electives are required and should be chosen after consultation with and approval of the Department Adviser. They should be distributed as follows:

A minimum of twelve (12) hours of Humanities and Social Science Electives are required and should be chosen from at least two Departments of Art, English, Foreign Languages, Music, Economics, History and Political Science, Sociology, Psychology and Guidance.

A minimum of eleven (11) hours of Technical Electives are required; at least seven (7) of these hours must be in Advanced Engineering courses.

A minimum of six (6) hours of Mathematics and Science; three (3) hours of Advanced Mathematics and three (3) hours of Physical, Biological or Earth Science.

A minimum of five (5) hours of Free Electives are required and may be accumulated in any department.

* May be taken in Fall or Spring.

COURSES IN ELECTRICAL ENGINEERING**Department Code—420****Undergraduate****100. Interface to Electrical Engineering I** Credit 4(3-3)

An introductory course for freshmen engineering majors. Application of Algebra, Matrices, Trigonometric functions, etc. as engineering tools. Use of the slide rule and digital computer as computational aids. Resistive circuit theory. Coordinated laboratory work.

101. Interface to Electrical Engineering II Credit 4(3-3)

A continuation and expansion of E.E. 100. Fundamental laws and theorems of linear circuit theory coordinated laboratory work. Prerequisite E.E. 100.

325. Principles of Electromagnetic Waves. Credit 3(3-0)

Electromagnetic concepts and effects, vector analysis. Corequisite: 225-500.

337. Electric Circuit Analysis I. Credit 4(3-3)

Transient and steady state solutions to first and second order linear systems in the time and frequency domains; introduction to time varying and nonlinear systems. Coordinated laboratory exercises. Prerequisite: 420-101.

441. Basic Electrical Engineering I. Credit 4(3-3)

Electrical engineering, fundamentals and applications for non-electrical engineering students. Electric and magnetic fields; network theory and application; direct and alternating current apparatus. Coordinated laboratory work. Prerequisites: 227-222 and 225-117.

442. Basic Electrical Engineering II. Credit 4(3-3)

Electronic circuit theory and applications; control of electrical apparatus; electrochemical processes; electronic analog and digital computer principles. Coordinated laboratory work. Prerequisite: 420-441.

448. Electric Circuit Analysis II. Credit 4(3-3)

Periodic function analysis of nth order linear systems, Fourier series and Laplace transform techniques, with coordinated laboratory work. Prerequisite: 420-337.

450. Electromagnetic Radiation and Microwave Theory. Credit 3(3-0)

The basic postulates of electromagnetism; the integral laws of free space; the differential laws in free space; static fields; time varying fields. Prerequisite: 420-325.

452. Electronics I. Credit 4(3-3)

Electron Ballistics; thermionic, high field and photoemission as applied to vacuum tubes, semi-conductors, gas-filled tubes and specialized tubes. Co-ordinated laboratory work. Limited application of basic principles. Prerequisite: 420-337.

501. Circuit Analysis III. Credit 3(3-0)

Analysis of system responses to signals using convolution, Fourier integral, spectral, sampling, correlation, and probabilistic techniques. Prerequisite: 420-448 or consent of instructor.

565. Electronics II.

Credit 4(3-3)

A continuation of Electronics I. Principles of electronic circuits; rectifiers and filters; amplifiers; feedback and oscillatory systems. Techniques using semiconductors, vacuum tubes and gas filled tubes are employed. Coordinated laboratory work. Prerequisite: 420-452.

570. Electric Machinery I.

Credit 4(3-3)

Electromechanical energy conversion principles; basic rotating machines; steady state and transient analysis of the ideal d-c machine, synchronous machine and induction machine. Coordinated laboratory work. Prerequisite: 420-448 and 420-450.

571. Electric Machinery II.

Credit 4(3-3)

Physical factors influencing performance of the realistic machine; single and three phase transformers; autotransformers; D-C machine characteristics and applications; synchronous and polyphase induction machine characteristics; fractional-horsepower a-c machines. Coordinated laboratory experience. Prerequisite: 420-570.

575. Electrical Engineering Seminar II.

Credit 1(1-0)

Lectures, reports and discussion on current developments and practices in the design and application of electrical and electronic components and systems.

Technical Electives in electrical engineering areas of concentration should be selected from the following Undergraduate-Graduate Courses:

- 400-604 Analog Computer Applications
- 400-606 Automatic Control Theory
- 400-612 Communication Systems
- 400-614 Communication Theory
- 400-622 Electronic Engineering
- 400-626 Engineering Research
- 400-627 Fundamentals of Logic Systems
- 400-634 Instrumentation: Theory and Applications
- 400-646 Network Synthesis
- 400-654 Projects in Electronic Networks and Systems
- 400-674 Transmission of Signals and Power

Course descriptions for the above courses can be found in School of Engineering Advanced Undergraduate-Graduate Courses, Code 400 Section.

DEPARTMENT OF MECHANICAL ENGINEERING

SURESH CHANDRA, *Chairman*

The mechanical engineer is concerned with the design, manufacture, and evaluation of systems for the conversion of natural resources into useful energy devices. He must be prepared to develop new sources of power, propulsion, and transportation; be capable of meeting the challenges of the new problems in society due to a greater awareness of the interaction between technology and the environment.

The program followed by the student in the Department seeks to develop him both liberally and professionally while preparing him to cope with the major concerns of the profession. It should prepare the student for a career in 1) research and development, 2) design of systems, 3) thermal sciences, 4) production, and 5) technical management.

To aid in the analysis and research training, the Department encourages the use of the University Computer Science Center where programs are processed on a Control Data Corporation Model 3300 computer system. Programming techniques in Fortran are introduced during engineering orientation and in Engineering Analysis. Thereafter, continued use of electronic digital systems become a part of the training process.

Experimental training is practiced in specialized laboratories in instrumentation and fluid flow, fuels and thermal systems, metallurgy, materials testing, and vibration characteristics.

Additional research experience and experimental techniques are available through the faculty research and student electives as over fifty percent of the faculty are engaged in active research projects.

Students interested in earning while they learn the practical aspects of engineering, may elect to participate in the Co-operative Education Program within the Department. Information on the program and other details may be secured by writing to the Department.

PROGRAM FOR MECHANICAL ENGINEERING MAJORS

Freshman Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
English 100, 101	3	3
History 100, 101	3	3
*Mathematics 116, 117	5	5
Mechanical Engineering 110, 111	1	1
Mechanical Engineering 101	2	—
Chemistry 101	—	3
Chemistry 111	—	1
	14	16

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Humanities 200, 201	3	3
Physics 221, 222	5	5
Mechanical Engineering 200, 335	3	3
Mechanical Engineering 226, 339	3	2
Mathematics 300	—	4
**Electives	3	—
	17	17

* Students entering with a deficiency in mathematics or score low on the Mathematics Placement Examination must begin with Pre-Engineering Mathematics and the above mathematics sequence would be shifted one semester.

** At least six (6) credit hours of electives must be taken from the Humanities-Social Science Group and at least nine (9) credit hours from the Technical Group; six (6) credit hours are free electives.

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Mechanical Engineering 336, 361	4	3
Mechanical Engineering 337, 440	3	3
Mechanical Engineering 441, 442	3	4
Electrical Engineering 441, 442	4	4
**Electives	3	3
	<hr/> 17	<hr/> 17

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Economics 301	3	—
Mechanical Engineering 443	—	3
Mechanical Engineering 560, 562	3	4
Mechanical Engineering 564, 565	3	3
**Electives	6	6
	<hr/> 15	<hr/> 16

Total Credit Hours: 131

**MECHANICAL ENGINEERING
COOPERATIVE EDUCATION PROGRAM**

(Based on two students—"A" and "B")

First Year

	<i>Fall</i>	<i>Spring</i>	<i>Summer Student A (B Working)</i>	
English 100, 101	3	3		
History 100, 101	3	3		
ME 110, 111	1	1	Physics 221	5
*Math 116, 117	5	5	Humanities 200	3
ME 101	2	—		
Chemistry 101	—	3		
Chemistry 111	—	1		
	<hr/> 14	<hr/> 16		<hr/> 8

* Students entering with a deficiency in mathematics or score low on the Mathematics Placement Examination must begin with Pre-Engineering Mathematics and the above mathematics sequence would be shifted one semester.

** At least six (6) credit hours of electives must be taken from the Humanities-Social Science Group and at least nine (9) credit hours from the Technical Group; six (6) credit hours are free electives.

Second Year

<i>Fall</i>		<i>Spring</i>		<i>Summer</i>	
Student B		Student A		Student B	
(A working)		(B working)		(A working)	
Humanities 200	3	ME 200	3	Physics 222	5
Physics 221	5	Physics 222	5	ME 335	3
ME 200	3	Math 300	4		
ME 226	3	ME 335	3		
Math 300	4	ME 339	2		
	<hr/>		<hr/>		<hr/>
	18		17		8

Third Year

<i>Fall</i>		<i>Spring</i>		<i>Summer</i>	
Student A		Student B		Student A	
(B working)		(A working)		(B working)	
ME 226	3	ME 361	3	ME 441	3
ME 336	4	ME 336	4	Econ 301	3
ME 337	3	ME 337	3	**Electives	3
EE 441	4	ME 440	3		<hr/>
**Electives	3	ME 339	2		9
	<hr/>		<hr/>		
	17		15		

Fourth Year

<i>Fall</i>		<i>Spring</i>		<i>Summer</i>	
Student B		Student A		Student B	
(A working)		(B working)		(A working)	
ME 441	3	ME 440	3		4
EE 441	4	ME 442	4	**Electives	3
Econ 301	3	ME 443	3		<hr/>
Hum 201	3	EE 442	4		7
**Electives	3	ME 361	3		
	<hr/>		<hr/>		
	16		17		

Fifth Year

		Student A		Student B		Student B	
		<i>Fall</i>	<i>Spring</i>			<i>Fall</i>	<i>Spring</i>
Student A				ME 560, 562		3	4
ME 560, 562		3	4	ME 564, 565		3	3
ME 564, 565		3	3	ME 443		—	3
Hum 201		3	—	EE 442		—	4
**Electives		6	9	*Electives		12	3
		<hr/>	<hr/>			<hr/>	<hr/>
		15	16			18	17

Total Credit Hours: 131

* Students entering with a deficiency in mathematics or score low on the Mathematics Placement Examination must begin with Pre-Engineering Mathematics and the above mathematics sequence would be shifted one semester.

** At least six (6) credit hours of electives must be taken from the Humanities-Social Science Group and at least nine (9) credit hours from the Technical Group; six (6) credit hours are free electives.

COURSES IN MECHANICAL ENGINEERING**Department Code—440
Undergraduate**

- 101. Engineering Graphics I.** Credit 2(0-6)
Instrument practice; lettering; geometrical construction; projections; sections auxiliary projection; revolution; pictorial drawing; intersection and development. Drawing of fasteners, springs and gears; detail and assembly drawings; tracing and reproduction methods.
- 102. Engineering Graphics II.** Credit 2(0-6)
Representation of common geometrical magnitudes with points, lines, planes, and solids; concurrent noncoplanar forces; the solution of problems; advanced intersection and development. Prerequisite: M.E. 101.
- 110. Mechanical Engineering Freshman Seminar I.** Credit 1(0-2)
Orientation; introduction to engineering and mechanical engineering, engineering opportunities, and the tools and processes of engineering. Formulation, design and execution of engineering problem solutions.
- 111. Mechanical Engineering Freshman Seminar II.** Credit 1(0-2)
Continuation of Mechanical Engineering 110.
- 200. Engineering Analysis.** Credit 3(2-2)
The introduction of technical writing, applications of mathematics and science in engineering problems, and the tools of engineering; the electronic analog computer, electronic digital computer and the slide rule are presented as tools for solving matrix problems and other related problems. Prerequisite: Math. 116.
- 226. Manufacturing Processes.** Credit 3(2-2)
Fabricating methods by machining, forming, casting, welding and adhesive bonding; measuring and gaging; automation; numerical control of machine tools; economics of metal manufacture; plastics.
- 300. Plane Surveying.** Credit 2(1-3)
The methods of using the compass, transit, tape and level in making plane surveys. Lectures and field work. Elementary stadia work. Prerequisite: Trigonometry, Math. 110 or equivalent.
- 335. Mechanics I, Statics.** Credit 3(3-0)
Basic vector concepts of force, moment of a force; analytical and graphical techniques in the analyses of force and moment; conditions of equilibrium in frames, trusses, machine members under static loads; law of friction; distributed forces; determination of centroid, mass center, area and mass moment of inertia. Prerequisites: Physics 221 and Math. 117.

336. Strength of Materials.

Credit 4(3-2)

Introduction to normal and shearing stresses; analysis of shear and moment distribution in beams; shear and fiber stresses in beams; deflection of beams; torsional stresses in shafts, springs; critical loads in beam-columns; analysis of combined stresses; experimental work on the mechanical behavior of materials including concrete and wood; experimental determination of fatigue and impact properties; determination of hardness of various materials. Prerequisite: M.E. 335.

337. Mechanics II, Dynamics.

Credit 3(3-0)

Introduction to the kinematics of particles and rigid bodies in translation, rotation and plane motion; introduction to the concepts underlying the work-energy principles and impact-momentum principles. Prerequisite: M.E. 335.

339. Engineering Practice.

Credit 2(2-0)

Communication, law, human relations and professional development in the practice of engineering. Development and use of communication tools, professional understanding and contract documents. Prerequisite: Eng. 101.

361. Fluid Mechanics.

Credit 3(2-2)

Principles of static and dynamic behavior of incompressible fluids with some applications to fluid machinery. Experimental work in fluid mechanics and instrumentation. Prerequisite: Math. 117, Corequisite: Math. 300.

440. Kinematics.

Credit 3(2-2)

A condensed course covering relative motions, velocities and accelerations of machine parts including linkages, cams and gears. Prerequisites: M.E. 101, Math. 116.

441. Thermodynamics I.

Credit 3(3-0)

Thermodynamic properties of substances. Development of the first and second laws on a macroscopic system basis. Application to thermodynamic processes involving ideal and real gases. Prerequisite: Physics 221, Math. 117.

442. Thermodynamics II.

Credit 4(3-3)

A continuation of Thermodynamics I including first and second law applications to power, heating, and refrigeration cycles. The subjects of gas mixtures, psychrometrics and heat transfer are introduced. Experimental work in thermal sciences. Prerequisite: M.E. 441.

443. Production Management.

Credit 3(3-0)

Problems relating to the engineer's role as consultant on matters of investment and operations, cost concepts, profit-volume relationships and analysis, treatment of make or buy decisions, renewal or replacement decisions, minimum cost problems, simple linear programming models. Prerequisite: Economics 301.

444. Undergraduate Projects.

Credit (1-3)

Study arranged on engineering topics of interest to student. A faculty member will serve as project advisor. Topics may include analytical and/or experimental work and encourages independent study. Prerequisite: Permission of Department and agreement of faculty member as advisor.

450. Introduction to Nuclear Engineering.

Credit 3(3-0)

A survey of the engineering applications of nuclear energy. The principles and practices of isotope separation, production of plutonium, and nuclear reactor operations

are studied along with the peace-time uses of products and by-products of nuclear reactors. Major engineering problems involved in each phase of the study are defined and the special methods of approach indicated. Prerequisites: Physics 222.

560. Metallurgy. Credit 3(2-2)

Principles of physical metallurgy; physical properties of metals; alloying and equilibrium diagrams; ferrous and non-ferrous metallurgy; corrosion and deformation of metals; principles of heat treatment processes; experiments on pyrometry, metallography, heat treatment and thermal equilibrium diagrams. Prerequisites: M.E. 226, Chemistry 101.

561. Environmental Control. Credit 4(3-2)

Principles of heating and air conditioning and their applications to design of environmental control systems; determination of building heating and cooling loads; principal equipment, layout and controls are discussed for various types of systems. Prerequisite: M.E. 441.

562. Heat and Mass Transfer. Credit 4(3-3)

Relation of heat transfer to thermodynamics. Conduction of heat in steady and unsteady states. Heat transfer by radiation, free and forced convection. Mass diffusion. Experimental work in heat transfer. Prerequisites: M.E. 361, M.E. 441.

564. Machine Design I. Credit 3(2-2)

Introduction to the design process; the design and development of machine elements; computer-aided design; project work. Prerequisites: M.E. 440 and M.E. 336.

565. Machine Design II. Credit 3(2-2)

Continuation of the design and development of machine elements; analysis, synthesis and design of machine systems; project and work. Prerequisite: M.E. 564.

566. Mechanical Vibrations. Credit 4(3-2)

An introduction to the dynamics of systems with and without external damping, stability, lumped, and distributed. Vibration isolation mounts and control systems are analyzed with classical differential equations, electro-mechanical analogies and computer methods. Prerequisites: M.E. 336 and M.E. 337.

568. Gas Dynamics. Credit 3(2-2)

Principles of one-dimensional compressible fluid flow. Normal shocks. Flow with friction, heating and cooling. Introduction to two-dimensional flows. Experimental work in fluid flow. Prerequisites: M.E. 361, M.E. 441.

572. Mechanical Engineering Seminar I. Credit 1(0-2)

Reports and discussions on special topics in mechanical engineering and related fields. Prerequisite: Senior standing in mechanical engineering.

573. Mechanical Engineering Seminar II. Credit 1(0-2)

Continuation of Mechanical Engineering 572. Prerequisite: Senior standing in Mechanical Engineering.

COURSES IN ENGINEERING**Department Code—400**

Advanced Undergraduate and Graduate

Number and Course	Credit
602 Advanced Strength of Materials	3(3-0)
604 Analog Computer Applications	3(2-3)
606 Automatic Control Theory	3(3-0)
612 Communication Systems	3(3-0)
614 Communication Theory	3(3-0)
622 Electronic Engineering	4(3-3)
624 Elementary Nuclear Reactor Theory	3(3-0)
626 Engineering Research	Variable
627 Fundamentals of Logic Systems	3(3-0)
632 Information Theory	3(3-0)
634 Instrumentation-Theory and Applications	3(3-0)
642 Management, Organization & Industrial Economics	3(3-0)
644 Matrix Analysis of Structures	3(2-2)
646 Network Synthesis	3(3-0)
648 Numerical Analysis for Engineers	3(3-0)
650 Operations Research	3(3-0)
652 Plates and Shells	4(2-4)
654 Projects in Electronic Networks and Systems	3(1-6)
655 Professional Development I	Variable 1-3
656 Professional Development II	Variable 1-3
660 Selected Topics in Engineering	3(3-0)
666 Special Projects	Variable 1-3
672 Theory of Elasticity	3(3-0)
674 Transmission of Signals and Power	3(3-0)
702 Applied Numerical Methods	3(3-0)
722 Electromagnetic Wave Theory	3(3-0)
724 Electronic Systems Analysis	3(3-0)
742 Mechanical Properties and Theories of Failure	3(3-0)
744 Network Matrices and Graphs	3(3-0)
772 Theory and Design of Digital Systems	3(3-0)
603 Advanced Thermodynamics	3(3-0)
625 Engineering and Environment	3(2-3)
628 Foundation Engineering	3(2-2)
670 Semiconductor Theory	3(3-0)
700 Advanced Reinforced Concrete Design	3(2-2)
701 Advanced Structural Analysis	3(3-0)
710 Boundary Layer Theory	3(3-0)
715 Continuum Mechanics	3(3-0)
728 Experimental Stress Analysis	3(2-2)
735 Heat Transfer I—Conduction	3(3-0)
736 Heat Transfer II—Radiation	3(3-0)
738 Irreversible Thermodynamics	3(3-0)
740 Machine Tool Design	3(3-0)
750 Statistical Methods and Quality Control	3(3-0)
755 Plastic Analysis and Design	3(3-0)
757 Physical Metallurgy of Industrial Alloys	3(3-0)
759 Prestressed Concrete Theory and Design	3(3-0)

764 Rheology	3(3-0)
767 Structural Dynamics	3(3-0)
774 Theories of Manufacturing Processes	3(3-0)
776 Theory of Plasticity	3(3-0)
778 Theory of Vibrations	3(3-0)
779 Advanced Structural Steel Design	3(2-2)

ADVANCED UNDERGRADUATE AND GRADUATE COURSES

400-602. Advanced Strength of Materials. Credit 3(3-0)

Stress-strain in relations as applied to statically indeterminate structures, bending in curved bars, plates, shells, and beams on elastic foundations; strain energy concepts for formulation of flexibility matrix on finite elements; bending in beams and plates; introduction to cartesian tensor notation and matrix structural analysis.

Prerequisite: 440-336 or equivalent.

400-603. Advanced Thermodynamics. Credit 3(3-0)

Statistical mechanics and microscopic properties from statistical methods. Equilibrium, information, generalized coordinates, and general variables.

Prerequisite: 400-442 or equivalent.

400-604. Analog Computer Applications. Credit 3(2-3)

The course consists of an introduction to the analog computer; methods of programming for the solution of linear and non-linear differential equations, dynamic response of physical systems and simulation of physical systems and phenomena.

Prerequisite: 225-300 or equivalent.

400-606. Automatic Control Theory. Credit 3(3-0)

The automatic control problem; review of operational calculus; state and transient solutions of feedback control systems; types of servomechanisms and control systems; design principles.

Prerequisite: 420-501 or equivalent.

400-612. Communication Systems. Credit 3(3-0)

This course covers the factors affecting the performance of communication systems, such as intermodulation noise, thermal noise, bandwidth, and the design of pulse modulation systems including delta and pulse code. Communication systems using earth satellites are covered in great detail including space communication.

Prerequisite: 420-565 or equivalent.

400-614. Communication Theory. Credit 3(3-0)

A course covering fundamental principles of modulation theory which are commonly used in the design of communication systems; linear modulation systems—amplitude, double and single sideband, and vestigial sideband modulation; and non-linear modulation system—frequency and phase.

Prerequisite: 225-500 and 420-452 or equivalent.

400-622. Electronic Engineering. Credit 4(3-3)

A study of various types of electronic circuits used in engineering practice—wave shaping and computing circuits, photosensitive devices and circuits; control and switch-

ing circuits; modulation and de-modulation circuits. Coordinated laboratory work with industrial applications and special projects.

Prerequisite: 420-565 or equivalent.

400-624. Elementary Nuclear Reactor Theory. Credit 3(3-0)

A lecture course in the principles of chain reactors, slowing down of neutrons, neutron diffusion equations, space distribution of neutrons, conditions for criticality, reactor dimensions for simple geometries, elementary group theories, and time dependent reactor behavior. Prerequisite: 225-300 and 400-450 or equivalent.

400-625. Engineering and Environment Credit 3(2-3)

An examination of the engineering role, impact, and demands upon the environment relative to its conditions, limitations, chain linkages and effects.

Prerequisite: Consent of Instructor.

400-626. Engineering Research. Credit Variable

Speech investigation adapted to the special abilities of individual students.

Prerequisite: Consent of Instructor.

400-627. Fundamentals of Logic Systems. Credit 3(3-0)

Introduction to digital information handling concepts of counting, transfer, sequence control, selection, addressing and digital system control.

Corequisite: 420-452 or equivalent.

400-628. Foundation Engineering Credit 3(2-2)

Subsoil investigations, analysis and design of foundations and other substructures. Caisson and cofferdam design and methods of construction—ground water control.

Prerequisite: 410-564 or equivalent.

400-632. Information Theory. Credit 3(3-0)

Probability theory and its application in the analysis of information transfer. Special attention is given to information in communications, random signals, noise processes, microscopic processes and macroscopic events.

Prerequisite: 420-501 or equivalent.

400-634. Instrumentation-Theory and Applications. Credit 3(3-0)

Consideration is given to applications of software and hardware techniques of instrumentation. Attention is given to treatment of data, errors in measurements and instruments capabilities and limitations of instruments as to precision and accuracy. Commercial instruments, transducers and their specifications will be used as models to illustrate basic principles involved. Students will be encouraged to design instrumentation for measurements of both electrical and non-electrical quantities in systems, sub-systems and processes.

Prerequisite: 420-452 or equivalent.

400-642. Management, Organization and Industrial Economics. Credit 3(3-0)

The production system, objectives and attitudes of production management, production management models: decisions, planning, behavioral and control models. Operations and the design of the control system—inputs, process and output control. Industrial economy: concepts in economy analysis, selections, interest formulas, depreciation, pattern for analysis.

Prerequisite: 400-443 or equivalent.

400-644. Matrix Analysis of Structures. Credit 3(2-2)

Lecture and Laboratory. Review of matrix algebra; statically and kinematically, indeterminate structures; introduction to flexibility and stiffness methods; applications to beams, plane trusses and plane frames.

Prerequisite: 410-457 or equivalent.

400-646. Network Synthesis. Credit 3(3-0)

Use of positive real functions and linear graphs in the synthesis of passive networks. Investigation of the properties of the driving point and transfer functions of passive networks and the synthesis of one and two part networks using positive real functions. Linear graphs and topological aspects are introduced.

Prerequisite: 420-448 or equivalent.

400-648. Numerical Analysis for Engineers. Credit 3(3-0)

Scientific programming, error analysis, matrix algebra, eigenvalue problems, curve fitting approximations, interpolation, numerical differentiation and integration, solutions to simultaneous equations, and numerical solutions of differential equations.

Prerequisite: Consent of Instructor.

400-650. Operations Research. Credit 3(3-0)

Management decision making, queuing theory, probability and sequences, formulation of mathematical models of processes with orientation to optimizing by use of digital computers.

Prerequisite: 225-224 or equivalent.

400-652. Plates and Shells. Credit 4(2-4)

Lecture and Laboratory. Introduction to plane plate theory; membrane stresses in shells with axial symmetry; cylindrical shells; applications in the design of shell roofs, tanks, pipelines and pressure vessels.

Prerequisite: 410-455 or equivalent.

400-654. Projects in Electronic Networks and Systems. Credit 3(1-6)

Special topics and laboratory work of special interest to the students in electronic networks and communications circuits; most of the work is given by the project method and emphasizes actual circuit construction.

Prerequisite: 420-452 or equivalent.

400-655. Professional Development I. Credit Variable
(1-3)

Directed self-study by the student in exploring an area both of special interest to the student and of mutual interest to Architectural Engineering faculty member(s).

400-656. Professional Development II. Credit Variable
Continuation of 400-655. (1-3)**400-660. Selected Topics in Engineering.** Credit 3(3-0)

Selected engineering topics of interest to students and faculty. The topics will be selected before the beginning of the course and will be pertinent to the programs of the students enrolled.

Prerequisite: Consent of Instructor.

400-666. Special Projects.Credit Variable
(1-3)

Study arranged on a special engineering topic of interest to student and faculty member, who will act as advisor. Topics may be analytical and/or experimental and encourage independent study.

Prerequisite: Consent of Instructor

400-670. Semiconductor Theory

Credit 3(3-0)

An examination of the phenomena of solid-state conduction and devices using band modeling.

Prerequisite: 420-565 or equivalent.

400-672. Theory of Elasticity.

Credit 3(3-0)

Introduction; stress, strain; stress-strain relations; energy principles; special topics.

Prerequisites: 400-336 and 225-300 or equivalent.

400-674. Transmission of Signals and Power.

Credit 3(3-0)

Generalized transmission circuits; transmission line parameters; long distance steady state transmission; transients in transmission lines; signal transmission lines; high frequency lines.

Prerequisites: 420-448 and 225-300 or equivalent.

GRADUATE COURSES**400-700. Advanced Reinforced Concrete Design.**

Credit 3(2-2)

Advanced theory and methods applied to the design of reinforced concrete structures, including yield line methods, ultimate strength theory and limit design.

Prerequisite: 410-455 or equivalent.

400-701. Advanced Structural Analysis.

Credit 3(3-0)

The analysis of various types of structural problems, including the applications of modern analytical methods. Prerequisite: 410-562 or equivalent.

400-702. Applied Numerical Methods.

Credit 3(3-0)

Numerical solutions to ordinary differential equations, initial-value and boundary-value problems, non-linear equations, numerical solution to partial differential equation, finite differences, and relaxation techniques. Stability of solutions.

Prerequisite: 225-500 or equivalent.

400-710. Boundary Layer Theory.

Credit 3(3-0)

A study of fluid flow with effects of viscosity analyzed as a boundary layer phenomena derivation of general equations of motion, velocity potential and stream function, perturbation theory and determination of drag and lift for subsonic and supersonic flows.

Prerequisite: 440-568 or equivalent.

400-715. Continuum Mechanics.

Credit 3(3-0)

The applications of the laws of mechanics and thermodynamics to the continuum: A rigorous development of the general equations applied to a continuum, the application and reduction of the general equations for specific cases of both solids and fluids.

Prerequisite: 440-336 or equivalent.

400-722. Electromagnetic Wave Theory. Credit 3(3-0)

Fundamental electromagnetic concepts at ultra high frequencies and above; analysis of transmission lines and networks; maxwell equations and their applications; wave guides and radiating systems.

Prerequisite: 420-450 or equivalent.

400-724. Electronic Systems Analysis. Credit 3(3-0)

An analytical approach using mathematics and graphical methods is used to arrive at solutions of problems encountered in interconnecting electrical, electronic, mechanical, and physical components to form a workable system. The formulation of compatible interfaces and transformation functions to make a workable system is the objective of the problems considered. Model and simulation theory is also utilized.

Prerequisite: 420-565 or equivalent.

400-728. Experimental Stress Analysis. Credit 3(2-2)

Principles and methods of experimental stress analysis. Photoelastic and micromasurement techniques applied to strain and stress investigations. Experiments using structural models.

Prerequisite: 410-457 or 400-602 or equivalent.

400-735. Heat TransferI—Conduction Credit 3(3-0)

The development and application of the general energy equations. Heat transfer through walls, cylinders, real boundary conditions, and numerical procedures.

Prerequisite: 440-562 or equivalent.

400-736. Heat Transfer II—Radiation. Credit 3(3-0)

A study of energy transfer by means of thermal radiation. Black body radiation, gray body radiation, gas radiation, and real body radiation.

Prerequisite: 440-562 or equivalent.

400-738. Irreversible Thermodynamics. Credit 3(3-0)

A study of processes which are inherently entropy producing. Development of general equations, theory of minimum rate of entropy production, mechanical processes, life processes, and astronomical processes.

Prerequisite: 440-603 or equivalent.

400-740. Machine Tool Design. Credit 3(3-0)

Basic principles of single point and multiple point tools, materials, forces, velocities, and power requirements. Dies and punches, material and manufacture, die and assemblies design clearances, supports, stops and pilots, strippers and knockouts. General requirements of a machine tool, design principles of machine tools, stiffness and rigidity standardization of speeds and feeds, layout of speed change gears, design of some constructional elements.

Prerequisite: 440-226 or equivalent.

400-742. Mechanical Properties and Theories of Failure. Credit 3(3-0)

Static properties in tension and compression, stress and combined stresses, fatigue, impact, creep and temperature. Various theories of failure under the above loading conditions. Applications.

Prerequisite: 440-336 or equivalent.

400-744. Network Matrices and Graphs. Credit 3(3-0)

Use of vector space techniques in the description, analysis and realization of networks modeled as matrices and graphs. The course investigates vector space concepts in the

modeling and study of networks. The system concept of networks is introduced and explored as a dimensional space consideration in terms of matrices and graphs.
Prerequisite: 420-501 or equivalent.

400-750. Statistical Methods and Quality Control. Credit 3(3-0)

Statistical series, frequency distribution and its analysis, central tendency, arithmetic mean, dispersion and skewness, time series analysis, the least squares methods, linear and nonlinear. The normal curve, theory of sampling, index numbers, collection of data, statistical tables, graphical presentation. Control charts for measurements and attributes, acceptance sampling by attributes and by variables.
Prerequisite: 225-624 or equivalent.

400-755. Plastic Analysis and Design. Credit 3(3-0)

Behavior of structural steel beyond the elastic limit. Ultimate load theory, the analysis and design of steel framed structures and components. Strength and behavior of structures stressed in the plastic range.
Prerequisites: 410-457 and 410-461 or equivalent.

400-757. Physical Metallurgy of Industrial Alloys. Credit 3(3-0)

Review of principles of alloying and heat treatment and their application to commercially important alloy systems. Principles of corrosion.
Prerequisites: 440-226 and 440-560 or equivalent.

400-759. Prestressed Concrete Theory and Design. Credit 3(3-0)

Theory and methods of design for prestressed concrete structures. Materials and construction techniques, ultimate strength design.
Prerequisite: 410-455 or equivalent.

400-764. Rheology Credit 3(3-0)

Study of the flow and deformation of matter. A rigorous analysis of the various modes of deformation of matter, space, deformation, strain, stress, strain-rate, creep, non-newtonian fluids, and plasma flows.
Prerequisite: Consent of Instructor.

400-767. Structural Dynamics Credit 3(3-0)

A study of structures subjected to dynamic loading. Formulation of mass-lumped and consistent, stiffness and damping matrices. Equivalent structural damping and elastic-plastic effects on response.
Prerequisite: 400-644 or equivalent.

400-772. Theory and Design of Digital Systems. Credit 3(3-0)

Digital system concepts of language models, algorithms, manipulative schemes, information structures, and pulse networks.
Prerequisite: Consent of Instructor.

400-774. Theories of Manufacturing Processes. Credit 3(3-0)

Review of metal cutting and forming, material behavior characteristics related to cutting and forming. Metal cutting analysis, mechanics of chip formation, thermal aspects of cutting, prediction of tool wear and tool life. Metal forming analysis, hot working and cold working, upper and lower bound solutions, slip line theory, plane strain. Applications to rolling, forging, wire drawing, extrusion, deep drawing and bending.
Prerequisite: 440-226 or equivalent.

400-776. Theory of Plasticity Credit 3(3-0)

Basic concepts of plastic deformation, trusses and beams, plane shear theory, axially symmetric problems, torsion, limit analysis, and extremum principles.

Prerequisite: 400-672 or equivalent.

400-778. Theory of Vibrations. Credit 3(3-0)

Vibration analysis of systems with one, two or multi-degrees of freedom. Instrumentation, continuous systems, computer techniques.

Prerequisite: 440-566 or equivalent.

400-779. Advanced Structural Steel Design. Credit 3(2-2)

Modern methods and advanced theory applied to the design of steel structures. Project design includes the solution to various types of framed structures.

Prerequisites: 410-457 and 410-563 or equivalent.

SCHOOL OF NURSING



SCHOOL OF NURSING

NAOMI W. WYNN, *Dean*

The School of Nursing offers a program leading to the Bachelor of Science Degree in Nursing which is four academic years and one summer session. It includes requirements in the physical, biological and social sciences, the humanities and nursing. The first two years of study encompass most courses generally labeled general education; the last two years of study are largely devoted to the Nursing major.

PHILOSOPHY

The faculty in Nursing subscribes to the beliefs and assumptions related to the system of concepts that describe, explain and predict man's behavior. Man is a unique human being with certain basic needs. He is affected, influenced and changed by his heredity, environment and experiences. There are variations in intensity and resources which hamper him from time to time in meeting his basic needs. Therefore, sensitivity to the needs of man and his striving to rise above the limitations of his human condition is essential. The nursing program is based on the faculty's beliefs concerning man and his intrinsic worth. Our participation through nursing education is in the preparation of the student to assist this unique individual in making his maximum contribution to society.

The faculty believes that education is a continuous process which provides opportunities for the development of the person to his maximum capacity for functioning in a dynamic society and that learning is a continuous modification of behavior through interaction with the environment. We recognize the need of the learner to have an understanding of his role in the educational process. The faculty, with student involvement, assumes responsibility for the planning, interpretation, implementation and guidance of the educational program.

Nursing education is the systematic and deliberate preparation of an individual to fulfill the role, function and responsibility of the professional nurse. It provides opportunities for personal growth which helps the learner for humanistic and professional endeavors. In addition, nursing education provides learning experiences which aids the learner in utilizing the problem solving method in meeting present and future nursing demands of society.

The faculty recognizes that nursing and other health professions are affected by the rapid expansion of knowledge and the social factors which influence change in the society and its health needs. We view our responsibility as a collaborating enterprise with other health professionals and auxiliary groups so that the various nursing functions will be altered, extended and developed within each of the professional nursing roles—practitioner, teacher, leader, collaborator and learner.

The practice of professional nursing offers the individual an opportunity to make a contribution to the welfare of people. As a member of the community health group and a leader of the nursing team, the professional nurse must have an appreciation of the methods of critical inquiry in order to participate in the development of nursing knowledge. We feel that professional nursing with its allies in health affairs, has responsibility for conserving life, promoting health and teaching the individual and his family how to attain and maintain optimal health. We believe that the person prepared to render professional nursing care utilizes nursing knowledge, understanding and skills derived from the biological, philosophical, psychological, and socio-cultural areas of study in assessing and making judgments when giving nursing care.

We further believe that the person prepared in this program to render professional nursing care has the foundation to pursue graduate education.

OBJECTIVES

In keeping with the purpose and philosophy of the University and the philosophy of the School of Nursing, the curriculum is planned so that the students who become professional nurses have the ability to:

1. Recognize the basic needs of man and the relationship of these needs to his behavior in the prevention of illness, promotion of wellness, individual growth and self-fulfillment.
2. Utilize biological, sociological, psychological and nursing concepts to identify and solve nursing problems irrespective of the setting.
3. Apply the intellectual skills of critical thinking, independent judgment, initiative, self-control and dignity in personal and professional settings.
4. Practice the professional nurses roles of practitioner, teacher, leader, collaborator and learner in the delivery of health care services.
5. Recognize the need for continuous study in this world of change.

CURRICULUM

Program for Nursing Majors

Freshman Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
Freshman Mathematics 100 & 102	3	3
Freshman Composition 100 & 101	3	3
General Chemistry 104 & 105	4	4
General Zoology 160	4	—
General Microbiology 121	—	4
Orientation	1	—
Physical Education or Personal Hygiene	(1)2	1
	—	—
	15	15

Sophomore Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
History of World Civilization 100, 101	3	3
Humanities I & II 200, 201	3	3
General Psychology 320	3	—
Principles of Sociology 100	—	3
Nutrition & Dietetics 337	3	—
Human Anatomy 469	3	—
Human Physiology 560	—	3
Historical Survey of Nursing 220	2	—
Fundamentals of Nursing 221	—	6
	—	—
	17	18

Junior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>	<i>Summer</i>
Maternal Child Health Nursing 440	8	—	—
Medical Surgical Nursing I, 441	—	8	—
Mental Hygiene 437	—	3	—
The Community 313	3	—	—
Speech Fundamentals 250	—	2	—
Principles of Family Health 442	3	—	—
Electives	3	3	—
Psychiatric Nursing 444	—	—	6
	17	16	6

Senior Year

<i>Course and Number</i>	<i>Fall Semester Credit</i>	<i>Spring Semester Credit</i>
*Medical Surgical Nursing II, 561	—	8
*Public Health Nursing 560	8	—
Nursing Leadership 562	4	—
Nursing Seminar 563	—	2
Electives	3	3
	15	13

COURSE DESCRIPTIONS**220. Historical Survey of Nursing**

Credit 2(2-0)

The study of Nursing as a profession and how it has developed. Knowledge of the past is essential to understanding the nature of the universe, man and his continuing progress through time. Emphasis is on the cultural, social, economic and religious factors which promoted nursing to its current status in society.

221. Fundamentals of Nursing

Credit 6(3-8-2)

The course introduces the student to the study of the basic needs of man, the nursing process and the nursing roles. Emphasis is placed on assessment and intervention of selected physiological and security needs of the individual. After the assessment, the student engages in patient care as a learner-practitioner.

440. Maternal Child Health Nursing

Credit 8(4-16)

The course provides the student an opportunity to broaden her knowledge of the needs of mothers and children during health, illness, childbearing and childrearing. Content includes concepts, principles, and theories essential to understanding the basic

* Courses offered each Semester

NOTE: The lower division requirements or first two years of the curriculum largely offered by the School of Arts and Science, and the first two courses in Nursing must be completed prior to registration in any upper division Nursing Courses.

Microbiology and Human Anatomy and Physiology may be taken after completion of General Zoology. Twelve semester hours of electives are required.

needs of mothers and children, the skills necessary for practice of Maternal Child Health Nursing, and the roles of the practitioner in Maternal Child Health. Prerequisite: Nursing 221.

441. Medical Surgical Nursing I Credit 8(4-16)

The course is designed to provide knowledge of concepts, theories, and principles essential to understanding the basic needs of man and the manifestations of pathophysiological alterations interfering with the gratification of needs in patients with selected medical-surgical problems. Emphasis is placed on knowledge that permits and facilitates sound judgment in the intervention and evaluation of nursing care. Prerequisite: Nursing 221.

442. Principles of Family Health Credit 3(2-2)

The course is designed to equip students with ideas and concepts useful in working with families. Emphasis is placed on the continuous assessment of the members of the family constellation in various phases of the maturational process. The nurse's role as a participant observer of the family life cycle is stressed in relation to actual or hypothetical nursing and/or social situations. Prerequisite: Nursing 221.

444. Psychiatric Nursing Credit 6(3-12)

The opportunity to explore the relationship between patient behavior and basic individual needs will be the major focus on psychopathology and the use of the self as the basic tool of Nursing Intervention. The course is designed to provide the learner with an opportunity to increase knowledge of basic psychosocial concepts as they relate to the nursing care of the emotionally disturbed individual. Prerequisites: Nursing 221, 440, 441 and 442.

560. Public Health Nursing Credit 8(4-16)

The course is concerned with the study of Nursing as an integral part of an organized community effort for the delivery of comprehensive personal and environmental health services. Emphasis is placed on the concept of the community, the family and the individual as distinct but related units of practice. Focus, throughout the course is on utilization of the nursing process in determining the appropriate nursing role to meet identified needs of individuals and families. Prerequisites: Completion of all junior Nursing Courses.

561. Medical-Surgical Nursing II Credit 8(4-16)

The course is designed to increase the student's knowledge and understanding of the basic needs of man and of specific pathophysiological alterations interfering with the gratification of these needs in patients with selected medical-surgical problems, to provide related learning experiences, complex in nature, requiring critical thinking and the utilization of previous and current knowledge in meeting the nursing needs of selected patients. Prerequisites: Completion of all junior nursing courses.

562. Nursing Leadership Credit 4(2-8)

Provides an opportunity to gain knowledge of leadership theories and to develop skill in applying this knowledge in selected situations. Concepts and methods of research are included to broaden the student's understanding of selected problems and major issues affecting the Nursing profession and its practitioners. Prerequisites: Completion of all junior Nursing courses.

563. Nursing Seminar Credit 2(2-0)

The course is designed to provide opportunity for the student to search for depth of nursing knowledge through various discussion and investigative methods. Emphasis is placed on the search for self-fulfillment through intellectual curiosity and continued learning. Prerequisites: Completion of all junior nursing courses.

THE GRADUATE SCHOOL





THE GRADUATE SCHOOL

ALBERT W. SPRUILL, *Dean*

Graduate education at North Carolina Agricultural and Technical State University was authorized by the North Carolina State Legislature in 1939. The authorization provided for graduate training in agriculture, applied science and allied areas of study. An extension of the graduate program, approved by the General Assembly of North Carolina in 1957, provided for enlargement of the program to include teacher education, as well as such other programs of a professional or occupational nature as might be approved by the State Board of Higher Education.

OBJECTIVES OF THE GRADUATE SCHOOL

The Graduate School of North Carolina Agricultural & Technical State University offers advanced study for qualified individuals who wish to improve their competence for careers in professions related to agriculture, applied science, education, science research, technology, the humanities and the social sciences. Such study of information and techniques is provided through courses of study leading to the Master of Science degree and through institutes, workshops, and individual courses designed for those who are not candidates for a higher degree but who desire advanced work in certain fields of study. Second, the Graduate School provides the foundation of knowledge and of techniques required for those who wish to continue their education in doctoral programs at other institutions. Third, the Graduate School assumes the responsibility of stimulating and encouraging scholarly research among students and faculty members.

It is expected that, in the course of their studies, graduate students (1) will have acquired special competence in at least one field of knowledge; (2) will have developed further their ability to think independently and constructively; and (3) will have developed and demonstrated the ability to collect, organize, evaluate, and report facts which will enable them to make a contribution in their field of study.

Degrees Granted

The Graduate School of North Carolina Agricultural and Technical State University offers the Master of Science in the following fields:

1. Agricultural Education
2. Chemistry
3. Education

A. Administration

- (1) Option for principals
- (2) Option for supervisors

B. Audiovisual Media

C. Elementary Education

- (1) Early Childhood Education
- (2) Elementary Education (general)
- (3) Intermediate Education

D. Secondary Education

- (1) Art
- (2) Biology
- (3) Chemistry
- (4) English
- (5) French
- (6) Guidance or Counselor Education
- (7) History
- (8) Mathematics
- (9) Physical Education
- (10) Reading
- (11) Science
- (12) Social Science

4. Engineering

5. Food and Nutrition

6. Industrial Education

A. Industrial (Arts) Education

B. Safety and Driver Education

ADMISSION TO GRADUATE STUDY

All applicants for graduate study must have earned a bachelor's degree from a four-year college. Application forms may be obtained from the office of the Graduate School and must be returned to that office with two transcripts of previous undergraduate and graduate studies. Processing of applications cannot be guaranteed unless they are received, with all supporting documents, in the Graduate Office at least fifteen days before a registration period. Applicants may be admitted to graduate studies unconditionally, provisionally, or as special students.

Unconditional Admission. To qualify for unconditional admission to graduate studies, an applicant must have earned an over-all average of 2.6 on a 4 point system (or 1.6 on a 3 point system) in his undergraduate studies. In addition, a student seeking a degree in Agricultural Education, Industrial Education, or Secondary Education must possess, or be qualified to possess, a Class A Teaching Certificate in the area in which he wishes to concentrate his graduate studies. A student seeking a degree with concentration in Administration and Supervision, Elementary Education, or Guidance must possess, or be qualified to possess, a Class A Teaching Certificate.

Provisional Admission. An applicant may be admitted to graduate studies on a provisional basis if (1) he earned his baccalaureate degree from a non-accredited institution or (2) the record of his undergraduate preparation reveals deficiencies that can be removed near the beginning of his graduate study. A student admitted provisionally may be required to pass examinations to demonstrate his knowledge in specified areas, to take specified undergraduate courses to improve his background, or to demonstrate his competence for graduate work by earning no grades below "B" in his first nine hours of graduate work at this institution.

Special Students. Students not seeking a graduate degree at A. and T. State University may be admitted in order to take courses for self-improvement or for renewal of teaching certificates. If a student subsequently wishes to pursue a degree program, he must request an evaluation of his record. The Graduate School reserves the right to refuse to accept as credit for a degree program hours which the candidate earned while en-

rolled as a special student; in no circumstances may the student apply towards a degree program more than twelve semester hours earned as a special student.

Admission to Candidacy for a Degree. Admission to graduate studies does not guarantee admission to candidacy for a degree. In order to be qualified as a candidate for a degree, a student must have a minimum over-all average of 3.0 in at least nine semester hours of graduate work at the University, must have removed all deficiencies resulting from undergraduate preparation, and must have passed the Qualifying Essay. Some departments require additional qualifying examinations. For details, see the *Graduate School Bulletin*.

Credit Requirements. The minimum course requirements for a graduate degree are thirty semester hours for students in thesis programs and non-thesis programs. It is expected that a student can complete a program by studying full-time for an academic year and a summer or by studying full-time during four nine-week summer sessions. A graduate student normally carries twelve to fifteen semester hours each semester of an academic year. If he is teaching full-time, he may not pursue more than six semester hours during the academic year. During the summer he may not earn more than one hour of credit for each week of residence. A student who does not complete his degree within six successive calendar years may lose credit for hours earned more than six years prior to his application for graduation.

Other Requirements. All students must pass a final comprehensive examination.

Fees. Fees for graduate students are listed in the General Information section of this catalogue.

Financial Assistantships. A limited number of assistantships are available. These positions may require teaching, laboratory supervision, research, or general assistance to a department or to a faculty member.

THE GRADUATE SCHOOL BULLETIN

General requirements for the Master's degree, curricula, course descriptions, and other information about graduate study will be found in the *Graduate School Bulletin*, which may be obtained from the Graduate Office.

DEPARTMENTS OF MILITARY SCIENCE AND AEROSPACE STUDIES



DEPARTMENTS OF MILITARY SCIENCE AND AEROSPACE STUDIES

The Reserve Officers' Training Corps (ROTC) at A&T State University consists of those students enrolled for training in the Department of Military Science or in the Department of Aerospace Studies. These Departments are integral academic and administrative subdivisions of the institution. The Senior Officer and the Senior Air Force Officer assigned to the University are designated as Professor of Military Science (PMS) and Professor of Aerospace Studies (PAS), respectively. These senior officers are responsible to the Department of Defense and the institutional Coordinator of Military Training for conducting the training and academic programs. Army officers who are assigned to the University as instructors in the ROTC are designated Assistant Professors of Military Science; Air Force officers, as Assistant Professors of Aerospace Studies. Noncommissioned officers of the Army are assigned as assistant instructors and administrative personnel. Noncommissioned officers of the Air Force are assigned as Specialists, Technicians, and Supervisors in the areas of Administration, Education, Personnel and Supply.

The basic course in either the Army or the Air Force ROTC is elective for all physically fit male freshmen and sophomores who are not less than 14 years of age. A student who has served at least six months of active duty service with any branch of the Armed Forces may receive appropriate credit for the freshman portion of the basic ROTC course. A student with one year or more of active service in the Armed Forces may receive appropriate credit for the entire basic course. He is encouraged to participate in one of the advanced programs to earn a commission.

DEPARTMENT OF MILITARY SCIENCE

COLONEL WILLIAM B. NEAL, *PMS*

The general purpose of the Army Reserve Officers Training corps (ROTC) program at this institution is to procure and produce junior officers, who through education, attitude, and inherent qualities are suitable for continued development as officers in the United States Army.

OBJECTIVES

The objectives of the ROTC program are:

1. To motivate, attract, and prepare selected students with potential to serve as commissioned officers in the Regular Army or US Army Reserve.
2. To provide an understanding of the fundamental concepts and principle of military art and science.
3. The ability to evaluate situations, to make decisions, to understand people, and practice those attributes considered to be essential in a leader.
4. To develop a basic understanding of associated professional knowledge, a strong sense of personal integrity, honor, and individual responsibility.
5. To develop an appreciation of the requirements for national security.

PROGRAMS OF INSTRUCTION

Programs of instruction for the Army ROTC include a four year program and a two year program. The four year program consists of a two year basic course, a two year Advanced course and the Advanced ROTC Summer Camp. The two year program encompasses a basic ROTC Summer Camp, a two year Advanced course and the Advanced ROTC Summer Camp.

Enrollment in the Advanced course is contingent upon passing the ROTC qualifying examinations and selection by a board consisting of military and civilian faculty members.

All cadets participate in a "modified curriculum" program in which they are to take ten hours of enrichment courses for ROTC credit in addition to the military science courses.

The ROTC Flight program can be made available, provided a minimum of five (5) senior cadets can medically and academically qualify. Participating cadets are taught to fly light aircraft at Government expense and earn their pilot license.

Academic credit is awarded for successful completion of any ROTC courses.

TRANSFER CREDIT

A student may be allowed transfer credit for military training pursued at the service academies or institutions with ROTC units. Record of a student's prior military training is obtained from the institution concerned.

FINANCIAL AID

Students enrolled in the Advanced course are paid subsistence pay (non-taxable) at the rate of \$100.00 per month.

Students attending the Basic ROTC Summer Camp and the Advanced ROTC Summer Camp are paid at the rates established by the Secretary of the Army. One, two, three and four-year Army ROTC scholarships are available for selected students. Details on scholarships may be obtained from the Department of Military Science, N.C. A&T State University. All scholarship students receive \$100.00 per month subsistence pay and the Army pays tuition, laboratory fees and book costs for these students.

ORGANIZATION OF THE ARMY ROTC

The Army ROTC is organized into an Army ROTC Cadet Battalion. The Battalion consist of three companies, a Headquarters Company, A Company and B Company. The Drill Platoon and Bushmasters are a part of B Company for special ceremonies.

DISTINGUISHED CADETS

The Professor of Military Science with the concurrence of the President of the University is authorized to designate outstanding cadets Distinguished Military Students at the beginning of the senior year. These students are afforded the opportunity to apply for a commission in the Regular Army. Those students who maintain their high standing until graduation may be designated Distinguished Military Graduates at that time.

UNIFORMS AND EQUIPMENT

Uniforms, textbooks, and equipment are provided the student at Government expense. A uniform deposit of ten (\$10.00) dollars is required of all students at the time of registration. The deposit will be refunded when uniforms are returned. The student is responsible for the care, safeguarding, and cleaning of property issued to him. He is financially responsible for the loss, excessive wear, breakage due to carelessness, or unauthorized use of clothing and equipment.

All ROTC property must be returned to the Military Property Custodian at the end of the school year or when the student withdraws from the program.

CADET WELFARE FUND

All Army ROTC cadets are automatically members of the Cadet Welfare Fund. A membership fee of \$5.00 is charged payable at initial registration each year.

SELECTIVE SERVICE AND ARMY ROTC

Basic Army ROTC cadets (freshmen and sophomores) are provided draft deferments through the Army ROTC Department. The military deferment (I-D) will preclude the student from being drafted as long as he meets the requirements of the University and the Basic ROTC program.

ACADEMIC ENRICHMENT: AN ROTC REQUIREMENT

ROTC students are required to enroll in an academic enrichment course during each year enrolled within the program. These enrichment courses (electives) are a prerequisite before a commission can be offered.

It is important to understand that these academic enrichment courses are "in addition to those electives required in the students academic major."

No deviation from this requirement will be authorized. However, another academic enrichment course may be selected, but each course selected must be approved by the students' Military Advisor. Adherence to the above procedure and requirement will be closely monitored.

Requirements for academic enrichment are as listed below:

- MS I - Two (2) semester hours per year
- MS II - Two (2) semester hours per year
- MS III - Three (3) semester hours per year
- MS IV - Three (3) semester hours per year

ENROLLMENT IN ROTC

To remain within the ROTC program, the student must be full time. Should difficulties be encountered and the student falls below a 12-hour semester load, the military advisor must be notified prior to dropping any course. Those students not carrying the minimum load of 12 hours, may be dropped from the program.

COURSES IN MILITARY SCIENCE**FALL SEMESTER*****101. Introduction of the Citizen/Soldier** Credit 1(1-1)

An introduction to the mission, organization and history of ROTC; Military and civilian obligation in relation to National Security; Individual Arms and Marksmanship Techniques; Emergency Medical Treatment.

SPRING SEMESTER***102. Introduction to United States Military Forces in Support of National Defense** Credit 1(1-1)

A discussion of the mission and responsibilities of the United States Military Forces in support of National Security with emphasis on the role of the individual participating citizen.

FALL SEMESTER***201. Chronological Events in American Military History** Credit 1(1-1)

A comprehensive survey of American Military History from the beginning of the United States Army to the present, with emphasis on the factors which lead to the organizational, tactical, logistical, operational, strategical, social and similar patterns found in the present day Army, including the application of the principles of war.

***202. Orienteering and Leadership Development** Credit 1(1-1)

A detailed study of orienteering to include basic fundamentals of map reading, grid systems, scale and distance, elevation and relief, military symbols, direction and location, and utilization of the declination diagram. Emphasis will also be placed on some selected enrichment subjects and evaluation of leadership development and a basic introduction to military term theory.

FALL SEMESTER***301. Leadership Training** Credit 2(2-2)

Special emphasis on the psychological, physiological and sociological factors which affect human behavior. Military teaching principles and how they affect the student.

SPRING SEMESTER***302. Introduction to Military Team Theory** Credit 2(2-2)

Fundamentals of the offensive and defensive tactics. Introduction to small unit communication systems. Internal defense operations. Presummer Camp training, and the role of each branch of the Army.

FALL SEMESTER***401. Seminars in Leadership Management and Professional Development** Credit 2(2-2)

The relationship between commander and staff; utilization and employment of military intelligence principles; introduction to unit management and administration, intro-

* Leadership Laboratory is conducted from 3-5 p.m. for MS III and MS IV cadets and 3-4 p.m. for MS I and MS II cadets on Thursdays.

duction to military law; seminar on service life and career planning for commissioned officers.

SPRING SEMESTER

***402. Advance Military Team Theory and Active Duty Orientation**

Credit 2(2-2)

A study of world change and military implications. A detailed study of Army and special type units. Introduction to various Army installations within the United States and abroad.

DEPARTMENT OF AEROSPACE STUDIES

LT. COLONEL ROBERT O. THORNTON, *Professor of Aerospace Studies*

The United States Air Force maintains a permanent Air Force Reserve Officers Training Corps at this institution for the purpose of conducting leadership training, military training, and flight training. The specific objective is to conduct a modern academic program keyed to the development of the Professional Officer. This program is offered in two divisions. The lower division for Freshmen and Sophomores is termed the General Military Course. The upper division, established as the Professional Officer Course is designed to continue the training of cadets as Juniors and Seniors, so as to provide a complete four year officer preparatory program. The entire Aerospace Studies curriculum is designed to commission quality young men and women who are not only educated in the academics of their university, but who have a competency in certain skills, and a strong motivation for active duty and an Air Force career.

UNIFORMS AND EQUIPMENT

All regularly enrolled cadets of the Air Force ROTC are furnished cost free, Air Force ROTC uniforms, flying clothing, equipment and textbooks. A deposit of ten dollars (\$10.00) is required of all cadets at the time of registration as security for clothing and equipment. This fee will be refunded upon return of all items issued. Each cadet is responsible for the maintenance and security of property issued to him. He is liable for the loss or abuse of this property. All property issued, must be returned at the end of the normal school year or upon withdrawal from school.

TRANSFER CREDIT

Transfer credit is permitted cadets entering the Air Force ROTC, from another advanced ROTC program (Air Force, Army or Navy), at any college, university or academy.

FINANCIAL AID

A subsistence fee of \$100.00 per month is paid advanced cadets (juniors and seniors) during the entire normal academic year while a member of the Air Force ROTC.

* Leadership Laboratory is conducted from 3-5 p.m. for MS III and MS IV cadets and 3-4 p.m. for MS I and MS II cadets on Thursdays.

Scholarships may be granted for periods of one, two, three and four years. Details on scholarships will be published by the Department of the Air Force and by the Department of Aerospace Studies, N.C. A&T State University. All students on scholarship receive \$100.00 per month retainer fee, and the Air Force pays tuition, laboratory fees and book costs.

STRUCTURE OF THE CADET GROUP

The Air Force ROTC Cadet Group, commanded by a Cadet Colonel, consists of three Cadet Squadrons and six Cadet Flights. Within the structure of this Group are such special functions as: The Security Police, the Drill Team and the elite Arnold Air Society.

SPECIAL HONORS

Outstanding performance in the Air Force ROTC Training Program, on the part of certain selected cadets can bestow on them the honor of Distinguished Cadets or Distinguished Graduate. Other honors are the Commandant's Award, the Vice-Commandant's Award, and the Air Force Times' Award.

CADET WELFARE FUND

All AFROTC Cadets are members of the Cadet Welfare Fund. A membership fee of \$4.00 is charged payable at initial registration each year.

AIR FORCE ROTC OFFICERS CLUB

The Cadet Officers Club provides advanced cadets with an opportunity to demonstrate organizational leadership ability and to promote social and cultural activities. Each advanced (POC) cadet is requested to become a member of the club and is obligated to pay club dues. The amount of the dues will be determined by club members each school year.

SELECTIVE SERVICE AND THE AIR FORCE ROTC

Air Force ROTC offers a four-year program for undergraduates and a two-year program for undergraduate and graduate students. While in either program a student is not subject to the draft, regardless of his lottery number.

COURSES IN AEROSPACE STUDIES

General Military Course (Basic)

AEROSPACE STUDIES (Courses for Freshmen)

- 101. U.S. Military Force in the Contemporary World I.** Credit 1(1-0)
(Formerly A.S. 7001)

A study of the doctrine, mission, and organization of the United States Air Force; U.S. strategic offensive and defensive forces; their mission and functions; employment of nuclear weapons.

- 102. Corps Training.** Credit 0(0-1)
(Formerly A.S. 7001)

Must be taken in conjunction with A.S. 101.

- 103. U.S. Military Forces in the Contemporary World II.** Credit 1(1-0)
(Formerly A.S. 7003)

A study of aerospace defense; missile defense; U.S. general purpose and aerospace support forces; the mission, resources, and operation of tactical air forces, with special attention to limited war; review of Army, Navy, and Marine general purpose forces.

- 104. Corps Training.** Credit 0(0-1)
(Formerly A.S. 7004)

Must be taken in conjunction with A.S. 103.

AEROSPACE STUDIES (Courses for Sophomores)

- 201. World Military Systems I.** Credit 1(1-0)
(Formerly A.S. 7021)

A comparative study of world military forces to include Free World land and naval forces, Free World air forces, Communist military systems, and trends in the development and employment of military power. (Fall Semester.)

- 202. Corps Training.** Credit 0(0-1)
(Formerly A.S. 7022)

Must be taken in conjunction with A.S. 201.

- 203. World Military Systems II.** Credit 1(1-0)
(Formerly A.S. 7023)

An analysis of the functions of U.S. alliances in the context of the cold war and the making of defense policies.

- 204. Corps Training.** Credit 0(0-1)
(Formerly A.S. 7024)

Must be taken in conjunction with A.S. 203.

Professional Officer Course (Advanced)

- 401. Growth and Development of Aerospace Power I.** Credit 3(3-0)
(Formerly A.S. 7041)

Study of communicative skills and the growth and development of aerospace power. The two basic subject matter areas—the development of airpower and aerospace power today are critically explored. Prerequisite: Completion of the General Military Course or the Six-Week Field Training. (Fall Semester.)

- 402. Corps Training.** Credit 0(0-1)
(Formerly A.S. 7042)

Must be taken in conjunction with A.S. 401.

- 403. Growth and Development of Aerospace Power II.** Credit 3(3-0)
(Formerly A.S. 7043)

Study of the future of manned aircraft and astronautics and space operations. Specific inquiries are made into: types of orbits and trajectories, characteristics of the solar system, current and planned capabilities for space operations, and the operating principles, characteristics, and problems associated with all major components of space vehi-

cle systems. Prerequisite: Completion of the General Military Course or the Six-Week Field Training. (Spring Semester.)

- 404. Corps Training.** Credit 0(0-1)
(Formerly A.S. 7044)

Study be taken in conjunction with A.S. 403.

AEROSPACE STUDIES (Courses for Seniors)

- 501. The Professional Officer I.** Credit 3(3-0)
(Formerly A.S. 7061)

A study of professionalism, leadership and management. Includes the meaning of professionalism, professional responsibilities and the Military Justice System. (Fall Semester.)

- 502. Corps Training.** Credit 0(0-1)
(Formerly A.S. 7062)

Must be taken in conjunction with A.S. 501.

- 503. The Professional Officer II.** Credit 3(3-0)
(Formerly A.S. 7063)

A study of leadership theory, functions and practices; management principles and functions; problem solving; and management tools, practices and controls. (Spring Semester.)

- 504. Corps Training.** Credit 0(0-1)
(Formerly A.S. 7064)

Must be taken in conjunction with A.S. 503.

- 505. Flight Training—Ground School.** Credit 3(3-0)
(Formerly A.S. 7045 & 7065)

Academic instruction devoted to Federal Aviation Regulations, Meteorology, Navigation, Computers, and Radio Navigation. (Required for all Pilot Trainees and available to POC Category I-P cadets only.)

- 506. Flight Training—Flying.** Credit 3(3-0)
(Formerly A.S. 7066)

Flight instruction provided to teach the fundamentals to take offs, landings, stalls, steep turns, traffic patterns, air discipline, basic flight maneuvers, emergency procedures and cross-country flights. (Required for all Pilot Trainees and available to Advanced POC cadets only.)

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WILLIAMS, DOROTHY	<i>Dormitory Supervisor</i>
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WILLIAMS, RAYMOND P.	<i>Technician</i>
WILLIAMS, ROBERT A., B. S.	<i>Assistant Property Custodian</i>
WILLIAMSON, CURTIS.	<i>Dormitory Supervisor</i>
WILSON, ZOLLIE.	<i>Assistant Farm Supervisor</i>
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ZEIGLER, JOHN, B. S.	<i>Business Manager</i>

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FRANKLIN C. GUNNOE, <i>Staff Sergeant</i>	<i>Supply Sergeant</i>
HUBERT F. SUTTON, <i>Sergeant Major</i>	<i>Chief Instructor</i>
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DEGREES CONFERRED JUNE 6, 1971

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With Highest Honor	David Lee Brown
With Highest Honor	John L. Davis
With Highest Honor	Lynn Wade Dorn
With Highest Honor	Bobby Jackson
With Highest Honor	Martin L. Jackson
With Highest Honor	Joseph W. Levister, Jr.
With Highest Honor	Irma Jeanette McCullough
With Highest Honor	Thelma McDowell
With Highest Honor	Jones Cathaleen Smith
With Highest Honor	Gail Elaine Thomas
With Highest Honor	Samuel Adams Woods
With High Honor	Shirley Ann Belk
With High Honor	Delphine Ruby Bristol
With High Honor	Ronnie I. Broome
With High Honor	Cynthia Congleton
With High Honor	Florence Elaine Farrior
With High Honor	Clarence Lea Goins
With High Honor	Linda D. Hairston
With High Honor	Ronald S. Haith
With High Honor	Margaret A. Hammond
With High Honor	Barbara Mae Joyner
With High Honor	William Roland Love
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June 6, 1971

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† Magna Cum Laude

‡ Summa Cum Laude

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Joyce A. Smith
Gwendolyn M. Spinks
*Glenda E. Thompson
*Brenda J. Thornhill
*Patricia A. Vaughn
Ethel G. Vick
Clementine Williams
Gloria D. Woodard

BACHELOR OF SCIENCE IN FRENCH EDUCATION

†Shirley A. Belk
Linda J. Daniels

*Valerie E. Lowe

‡Irma J. McCullough
Joanna Spruiell

BACHELOR OF SCIENCE IN HEALTH AND PHYSICAL EDUCATION

John D. Bess
Michael Bushrod
Savannah R. Craig
James R. Drayton, III
Joseph Howell

Florence D. Jones
Clifton Matthews, Jr.
Lester R. Moore
Dorothy A. Parker
Jerry L. Powell

Willie Reynolds, Jr.
Leslie L. Roberts
Dorffus Shaw, Jr.
Maceo C. Smith
Sytrina E. Whitworth

BACHELOR OF SCIENCE IN HISTORY

Lonnie E. Dawkins
Marcia D. Dorton
Paris Favors, Jr.
Acie Harris, Jr.

Joyce A. Harris
Willie G. Hunt, Jr.
Fred A. Lloyd

Matthew L. Simpson
Charles Williams
Carlton O. Yates

* Cum Laude

† Magna Cum Laude

‡ Summa Cum Laude

BACHELOR OF SCIENCE IN HISTORY EDUCATION

Walter A. Brown
 Percy E. Degraffenreid
 Shelby P. Douglas
 Gayle C. Ferguson
 Mary H. Griffin
 Ross L. Harrison

Robert E. Hughes, III
 Archie Hunter, Jr.
 †Barbara M. Joyner
 Von H. Langston
 †William R. Love
 Dorothy B. McLean

James S. Norman
 Richard A. Savage
 Clarence H. Smith, Jr.
 Vernon N. Stewart
 Margaret L. Wallace

**BACHELOR OF SCIENCE IN HOME ECONOMICS WITH MAJOR IN:
CHILD DEVELOPMENT**

Brenda L. Lamberson
 Deanna V. Reynolds

Amanda Smith
 Earlene K. Womack

CLOTHING, TEXTILES, AND RELATED ARTS

Claudia A. Goodson
 Brenda C. Lumpkins
 Ida M. Patterson

Nancy Phillips
 Annie B. Pride

Evelyn Tanner
 Diane N. Turner

EARLY CHILDHOOD EDUCATION

Sabra L. Cochran
 Ann D. Collins
 †Cynthia Congleton

Vashti L. Gaffney
 Patricia A. Harrison
 Harriette Hayes

Joyce A. Lindsay
 *Barbara A. Meeks
 Louise T. Shaw

HOME ECONOMICS EDUCATION

Floria P. Aldridge
 Irene J. Boone
 Rosa L. Bright
 Phyllis C. Caldwell
 Jessie D. Cooper
 †Linda D. Hairston

Matokia B. Kee
 Rosetta Linton
 Lizzie Carol Miles
 Catherine C. Moyer
 Clardia M. Osborne

Patricia Russell
 Dorothea M. Scott
 Judy H. Simmons
 Carol C. Strayhorn
 Remonia F. Whitfield

FOOD AND NUTRITION

Sharvari N. Desai

INSTITUTION MANAGEMENT

Catherine Burnett
 Sarah M. DeWitt

Sandra G. Keech
 Patricia A. Moore

Beatrice L. Pickett
 Selena G. Stanback

* Cum Laude

† Magna Cum Laude

‡ Summa Cum Laude

BACHELOR OF SCIENCE IN INDUSTRIAL ARTS EDUCATION

Hollie S. Brown	†Clarence L. Goins	Paul D. Kearney
James Thomas Caldwell, Jr.	Harvey Vernon Hayes	Floyd D. White
Harry F. Dixon		

**BACHELOR OF SCIENCE IN INDUSTRIAL TECHNOLOGY
(CONSTRUCTION)**

Levern Allen, Jr.	James J. Hankins	George D. Hinton
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**BACHELOR OF SCIENCE IN INDUSTRIAL TECHNOLOGY
(ELECTRONICS)**

Sterling C. Bass	Metto D. Hernandez	Johnnie R. Millner, Jr.
Isaac L. Bowers, Jr.	Chester Jenkins, Jr.	Ronald Murphy
Nicholas S. Bright	Robert L. Johnson	Keith A. Nixon
James B. Cherry	Wilbert R. Joyner	Wendell E. Parker
Eddie F. Foxx	‡Joseph W. Levister, Jr.	Elliott L. Smith
Howard L. Freeman	James L. Martin	Dennis L. Waddell
Booker T. Goodwin, Jr.	Dwight H. Meekins	Allen J. Williams
		Ashby C. Worrell, Jr.

**BACHELOR OF SCIENCE IN INDUSTRIAL TECHNOLOGY
(ENGINE POWER)**

Fred E. Blount, Jr.	†Ronald G. Robbins
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**BACHELOR OF SCIENCE IN INDUSTRIAL TECHNOLOGY
(MANUFACTURING)**

Robert L. Carelock	Alphonso E. Matthewson	Larry Underwood, Jr.
John L. Kirkland	William I. Pope	James M. West
Carl S. McNair	Wesley R. Porch	James W. Woolfork, II
	David R. Smith	

BACHELOR OF SCIENCE IN MATHEMATICS

John Earl Sanders	Cecelia E. White
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BACHELOR OF SCIENCE IN MATHEMATICS EDUCATION

‡Jannette D. Bell	*Martha A. Henderson	Herman M. Mewborn
William O. Boston	Robert F. Herbin	Daniel A. Piggott
*Malcolm E. Cain	Helen L. Lowe	Malinda D. Rhodes
*Gilbert Casterlow, Jr.	Claude McFarlane	Varona L. Wynn
Jacqueline D. Forman	Evelyn B. Metts	

* Cum Laude

† Magna Cum Laude

‡ Summa Cum Laude

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

Abbas Aberi	James E. Johnson, Jr.	Johnny A. Robinson
Larry A. Arrington	‡Sudhirschandra H. Patadia	Gregory D. Talley
Ralph B. Bell	‡Donald G. Pierce	Robert E. Watson
Bobby L. Brown		Raymond M. Womack

BACHELOR OF SCIENCE IN MUSIC EDUCATION

William W. Bullock	Paul L. Foster	Barbara J. Pierce
Brenda M. Cardwell	Mary L. Humphrey	Dennis R. Reid
Martha A. Crockett	Yvonne C. Knight	*Donald O. Thompson
John F. Dyer	*Carolyn Mosley	James D. Weston
	Dorothy I. Moye	

BACHELOR OF SCIENCE IN NURSING

Brenda S. Divers	Connie D. Kelley	Gail S. Ricks
Claudia F. Foster	Mae F. Lawson	*Katie G. Roach
Carolyn J. Giles	Cora B. McNeal	Amelia F. Smith
Edwina V. Griffin	Albert L. Mann	Lucirene Turner
*Jacqueline L. Harrison	Anita L. Miller	Harold T. Underwood
Nancy Horry	Carolyn L. Moore	Barbara A. White
Janice Y. Ingram	†Inez Perry	*Patricia A. Wilson
	*Emanuella M. Quick	

BACHELOR OF SCIENCE IN OFFICE ADMINISTRATION

Mary L. Ferguson	Georgia A. Kelly	Paulette Woodard
Patricia A. Givens	Donna M. Lee	Harlene R. Wright

BACHELOR OF SCIENCE IN PHYSICS

Booker T. Dawkins, Jr.	Orson T. Kirk	Kenneth E. Phillips
Hillard B. Hines, Jr.	†Ronald E. McNair	Charles R. Richardson
	Martin D. Moore	

BACHELOR OF SCIENCE IN POLITICAL SCIENCE

Richard E. Batts	‡Lynn W. Dorn	Marvin Hall
Kenneth V. Bryant	Michael L. Farrow	†Margaret Hammond
Clarence W. Counts, Jr.	Stanley K. Foshee	Roy W. Jordan
Marvin H. Dalton, Jr.	*Fred A. Freeman, Jr.	Lafayette E. Mitchell
‡John R. Davis	Melissa V. Graham	Walter D. Small
James A. DeGraphenried		Allen D. Whitehead, III
Curtis A. Deloatch		Dan Williams

* Cum Laude

† Magna Cum Laude

‡ Summa Cum Laude

BACHELOR OF SCIENCE IN PSYCHOLOGY

Walter L. Bailey
 Billy E. Biggs
 Lewis R. Byrd
 Delores C. Flood

Michael H. Freeman
 Milton L. Grady, Jr.
 Donnie C. Loftin
 Sterling L. McLaughlin

William A. Reed
 Archie N. Snipes
 Brynda J. Whitted
 *Jacquelyn L. Wright

BACHELOR OF SCIENCE IN RECREATION

Kenneth A. Free

Wilbur E. Wynn

BACHELOR OF SCIENCE IN SOCIAL SERVICE

Brenda L. Boykin
 Shirley M. Clark
 Jacqueline K. Corbett
 Belinda Duncan
 Ronald Cooper
 Lucretia Goodwin
 Judy E. Hill
 *Inza Howard
 Meddie C. Howell

Myrtle P. Jackson
 Margaret A. Johnson
 Marva L. Johnson
 Gloria Y. Keeye
 Doris A. Kirkland
 Talmadge M. Kinney
 Tyrone Leake
 †Irene Luckey
 Barbara A. McNair

*Carolyn A. Moore
 Shirley A. Quick
 Alzara L. Ransom
 Carlene Stith
 †Brenda J. Strickland
 Vivian A. Umphrey
 Valerie F. Villines
 Judy A. Watkins

BACHELOR OF SCIENCE IN SOCIOLOGY

Addie P. Brandon
 †Delphine R. Bristol
 Arthur L. Brown
 James W. Clay
 Wallsena Crittenden
 *Diane D. Dean
 Carolyn M. Elder
 Brenda A. Ewing
 Willa C. Fort

Norma E. Greenlee
 Elaine Jones
 Joseph K. Lawing
 Mildred E. Leigh
 Lillian J. Reddick
 William Smart
 †Frances B. Steele

‡Gail E. Thomas
 Herbert R. Tillery, Jr.
 Lorraine A. Timmons
 †Lorraine I. Turner
 Ellen M. Watt
 Julia Watt
 Jacqueline Whitted
 Eulis A. Willis
 *Janet M. Wilson

BACHELOR OF SCIENCE IN SOCIAL STUDIES

Joseph R. Daniels
 Bernard Edmond

William E. Ewing

Paul L. Jones
 Brenda G. King

**BACHELOR OF SCIENCE IN VOCATIONAL INDUSTRIAL EDUCATION
(AUTOMOTIVE INDUSTRIES)**

Roland P. Bailey, Jr.
 Matthew Beatty

Willie T. Cross
 Solomon C. Green
 William M. Howell

Moses M. James
 Ellis E. Lawrence

* Cum Laude

† Magna Cum Laude

‡ Summa Cum Laude

BACHELOR OF SCIENCE IN VOCATIONAL INDUSTRIAL EDUCATION (CONSTRUCTION)

Cleveland A. Bassfield

Jack Gray

BACHELOR OF SCIENCE IN VOCATIONAL INDUSTRIAL EDUCATION (DRAFTING)

James Watson

BACHELOR OF SCIENCE IN VOCATIONAL INDUSTRIAL EDUCATION (ELECTRICAL INDUSTRIES)

Thomas A. Bell

Gregory M. DeLon

Samuel T. Kay

DEGREES CONFERRED

June 6, 1970-71

MASTER OF SCIENCE IN AGRICULTURAL EDUCATION

Wilbert Curtis Artis, B.S., North Carolina A. and T. State University	1954
James Archie Brown, B.S., North Carolina A. and T. State University	1935
Aldon Louis Carson, B.S., North Carolina A. and T. State University	1953
Benjamin Currence, B.S., North Carolina A. and T. State University	1949
Calvin Hargrove, Jr., B.S., North Carolina A. and T. State University	1958
LeRoy James, B.S., North Carolina A. and T. State University	1957
Leroy Randolph Johnson, B.S., North Carolina A. and T. State University	1937
Frank Ervin Leathers, B.S., North Carolina A. and T. State University	1954
William Linzie Simmons, B.S., North Carolina A. and T. State University	1954

MASTER OF SCIENCE IN FOOD AND NUTRITION

Enid M. Knight, B.S., North Carolina A. and T. State University	1969
Sarah Carver Williamson, B.S., North Carolina A. and T. State University	1968

MASTER OF SCIENCE IN INDUSTRIAL EDUCATION

Edward Luther Fontaine, B.S., St. Paul's Polytechnic Institute	1953
Daniel Jones, B.S., Tuskegee Institute	1964
Gathier Rodgers, Jr., B.S., North Carolina A. and T. State University	1968
Henry Thomas Rorie, B.S. North Carolina A. and T. State University	1958

Robert Louis Seay, B.S., Maryland State College	1958
Vernell Stallings, B.S., North Carolina A. and T. State University	1964
William Joseph Watson, B.S., North Carolina A. and T. State University	1952
Joseph Phillip Weaver, B.S., North Carolina A. and T. State University	1963

MASTER OF SCIENCE IN EDUCATION

ADMINISTRATION-EDUCATION

Melvin Brevard Alsbrook, B.A., Livingstone College	1965
Willie James Bell, B.S., North Carolina A. and T. State University	1955
Arthur Bowden, Jr., B.S., North Carolina A. and T. State University	1955
David Alfred Brisbon, B.S., Morris College	1964
Roland Eben Buck, B.Ed., Njala University College, Njala, Sierra Leone	1969
Andrew Eaddy, B.S., Morris College	1959
Peyton Thomas Hairston, B.S., Winston-Salem State University	1964
Nathaniel Buddy Marshall, B.S., Fayetteville State College	1961
Margaret Garrett Price, B.S., North Carolina A. and T. State University	1962
Gordon Smith Sellars, B.S., Winston-Salem State University	1958
Warren Winston Simmons, B.S., North Carolina A. and T. State University ...	1953
David Evans Smoot, B.S., Livingstone College	1960
Wendell Scott Still, B.S., North Carolina Central University	1966
James H. Tyson, B.S., Fayetteville State University	1963
Sullivan Anthony Wellborne, Jr., B.S., North Carolina A. and T. State University	1961
Carl Van Williams, B.S., Allen University	1961
Robert Cornealius Wright, A.B., Johnson C. Smith University	1959

BIOLOGY-EDUCATION

Matthew Levonne Bannamon, B.A., Morris Brown College	1957
Betty Jean Cooper Crosland, B.S., North Carolina State University	1963
Robert Phillip Heagy, B.S., Edinboro State College	1962
Joyce Pauletta Hilliard, B.S., Bennett College	1965
Irene Sims Johnson, B.S., Bethune-Cookman College	1959
Roy Alexander Kerr, B.A., The University of Western Ontario	1955
Marilyn Delores Mills, B.S., North Carolina Central University	1962
Ambrose Onyukwe Nwosu, B.S., Shaw University	1968
Vertelle Lomax Staton, B.S., Livingstone College	1954
Raymond Harris Thompkins, B.A., Paine College	1959
Ronald Blake Thornton, B.S., North Carolina A. and T. State University	1970
Lorraine Elizabeth Walker, B.S., Johnson C. Smith University	1961
Robert Elliott Warwick, B.S., North Carolina A. and T. State University	1960

Robert Burdine Weatherton, B.S., Tennessee A. and I. State University	1960
Jonathan Dunbar Weston, B.S., North Carolina A. and T. State University	1966

CHEMISTRY-EDUCATION

Roland Gene Cain, B.S., Millersville State College	1963
Mae Frances Crawford, B.S., Livingstone College	1966
Fred Glenn Hamrick, B.S., Rio Grande College	1963

ELEMENTARY EDUCATION

Gwendolyn Ford Askew, B.S., Albany State College	1969
Pearl Arlene Bolden, B.S., Saint Paul's College	1962
Annie Pearl Bradley Burwick, B.S., Winston-Salem State University	1958
Eva Montague Corbett, B.S., Winston-Salem State University	1951
Emma Elizabeth Curry, B.A., Bennett College	1963
Florine Deloris Davis, B.S., Winston-Salem State University	1959
Hazel Weeks Dawson, B.S., Winston-Salem State University	1952
Malvola McGaney Gerald, B.S., North Carolina A. and T. State University	1955
Benjamin Franklin Henderson, B.S., Winston-Salem State University	1960
Ina Veola Hines, B.S., Winston-Salem State University	1964
Henry Hubbard, B.A., Johnson C. Smith University	1966
Doris Lee Murphy Hughes, B.A., Benedict College	1956
William Lee Keith, A.B., Livingstone College	1960
Grace Knuckles Knox, B.A., Benedict College	1967
Callie Mitchell Murphy, B.S., Winston-Salem State University	1949
Maggie Leatha Newkirk, B.S., Winston-Salem State University	1958
Shirley Jean Perry, B.S., Winston-Salem State University	1962
Betty Mims Prescott, B.A., Benedict College	1956
James Earl Rountree, B.S., Fayetteville State University	1964
Madie Lee Dick Rountree, B.S., Fayetteville State University	1963
Marian Williams Sheppard, B.S., Winston-Salem State University	1963
Doris Jean Cole Shoffner, North Carolina A. and T. State University	1958
Laura Lucille Small, B.S., Bethune-Cookman College	1960
Thelma Crawford Smith, B.A., North Carolina Central University	1960
Lessie Mae Walker Thorpe, B.S., North Carolina A. and T. State University	1952
John William Tinsley, B.S., Virginia State College	1964
Bernice Crosby Tyson, B.S., Winston-Salem State University	1958
Margery Johnson Warren, A.B., Florida A. and M. University	1944
Robert Levern Wilson, B.S., Allen University	1957

ENGLISH-EDUCATION

Lucy Martin Bolden, B.A., Bennett College	1960
Barbara Vaughan Carson, B.S., Elizabeth City State University	1963
Jimmy Floyd Cummings, B.S., Fayetteville State University	1960
Mary Sue Francis, B.S., North Carolina A. and T. State University	1963
Jacqueline Herbin Kerr, B.A., Bennett College	1960
Ollie Johnson McDowell, B.A., Bennett College	1962
Willie Fontaine Perkins, A.B., Virginia State College	1940
Claudia Piland Weston, B.S., Fayetteville State University	1965

FRENCH-EDUCATION

Curtis Eugene Spencer, B.S., North Carolina A. and T. State University	1969
Jean Patterson Wilson, B.A., St. Augustine's College	1961

GUIDANCE-EDUCATION

Vernon Leon Baron, B.S., North Carolina Central University	1963
Marlyne Lyttle Burnham, B.S., Winston-Salem State University	1958
William Vincent Graves, B.S., North Carolina A. and T. State University	1953
Zealouise Brewer Hough, B.S., Allen University	1954
Demark Anthony McCloud, B.A., Winston-Salem State University	1965
Carrie Gilmore Hamilton, B.S., Allen University	1956
Joan Elisa Morrow, A.B., Greensboro College	1963
Henrietta Jones Reid, B.A., Bennett College	1967
James Edward Sibert, B.S., North Carolina Central University	1963
Donald Maurice Wade, B.S., Maryland State College	1960
Michael Calloway Wallace, Jr., B.S., North Carolina A. and T. State University	1970
Lucy Cheston White, B.S., North Carolina A. and T. State University	1966

HISTORY-EDUCATION

Jacqueline Hunter Jenkins, B.A., Bennett College	1968
Earlon Martin, A.B., Johnson C. Smith University	1962
Peggy Hudson Richardson, B.S., Barber-Scotia College	1965
Leon Warren, B.S., North Carolina A. and T. State University	1960
Annette Marie Williams, B.S., Knoxville College	1966

MATHEMATICS-EDUCATION

Charles McClellan, Jr., B.S., Benedict College	1960
Frank Alexander Montgomery, B.A., The University of N. C. at Wilmington. . .	1965

Roosevelt Delano Odom, B.S., Johnson C. Smith University	1955
Shephard Scott, B.S., St. Augustine's College	1967
Neil Archie Terry, B.S., North Carolina A. and T. State University	1959

PHYSICAL EDUCATION

Dwight Delmont Brown, B.S., East Carolina University	1964
Aldon Levon Coefield, B.S., North Carolina A. and T. State University	1959
Wylie Eddie Harris, Jr., B.S., North Carolina A. and T. State University	1964
Paul Raymond Swann, B.S., North Carolina A. and T. State University	1960

SOCIAL STUDIES-EDUCATION

Mattie Roach Broome, A.B., Morgan State College	1953
Otis Wesley Hawkins, B.S., North Carolina A. and T. State University	1957
Harry Edward Millner, B.S., North Carolina A. and T. State University	1969
Herbert Gerald Parker, B.G.E., University of Omaha	1962
Culey Vick Stevenson, B.S., North Carolina Central University	1956
Elijah Elmo Stewart, II, B.A., St. Augustine's College	1962

DOCTOR OF HUMANE LETTERS

John C. McLaughlin	Edward R. Zane
--------------------	----------------

DOCTOR OF LAWS

James E. Cheek

COMMISSIONED AS SECOND LIEUTENANTS IN THE UNITED STATES AIR FORCE

Cadets Commissioned June 26, 1970

Thaddis R. Cates, *Supply Operations Officer*
Dannie M. Marshall, *Accounting-Finance Officer*

Cadet Commissioned August 19, 1970

*Ray L. Johnson, *Personnel Officer*

Cadets Commissioned January 27, 1971

Donald R. Exum, *Pilot*
Solomon C. Greene, *Pilot*
Thomas E. Holloway, *Biomedical Laboratory Officer*

* Distinguished Military Graduates

Jimmy L. Newkirk, *Accounting-Finance Officer*

*Thomas O. Sherman, *Pilot*

*Robert E. Watson, *Pilot*

Floyd D. White, *Pilot*

Cadets Commissioned June 6, 1971

Fred E. Blount, Jr., *Motor Vehicle Management Officer*

John F. Dyer, *Pilot*

Walter R. Glover, *Accounting-Finance Officer*

Hilliard B. Hines, Jr., *Pilot*

Bobby Jackson, *Cost Analysis Officer*

*Keith A. Nixon, *Pilot*

Kenneth E. Phillips, *Physicist*

Donald G. Pierce, *Pilot*

Kenneth B. Price, *Pilot*

Walter D. Small, *Intelligence Officer*

William B. Smith, *Pilot*

*Ronald B. Thornton, *Health Services Administrator*

Warren P. Turner, *Pilot*

COMMISSIONED AS SECOND LIEUTENANTS IN THE UNITED STATES ARMY UNITED STATES ARMY RESERVE APPOINTMENT AND BRANCH

Cadets Commissioned July 31, 1970

Harold B. Glover, *Transportation Corps*

George O. Jackson, *Infantry*

Charles E. Joyner, *Quartermaster Corps*

Wilbur W. Malloy, *Medic Service Corps*

Melvin C. Mason, *Medical Service Corps*

Cadets Commissioned August 14, 1970

Lawrence E. Barrett, *Signal Corps*

Robert F. Herbin, *Field Artillery*

Robert L. Lewis, *Corps of Engineers*

Herbert R. Tillery, *Military Police Corps*

Thomas L. Spence, *Infantry*

Cadet Commissioned December 11, 1970

Sterling S. McLaughlin, *Infantry*

Cadets Commissioned March 5, 1971

Andre S. Lennon, *Signal Corps*

Bernard V. Oliphant, *Quartermaster Corps*

* Distinguished Military Graduates

REGULAR ARMY APPOINTMENT AND BRANCH**Cadet Commissioned August 14, 1970**

*James E. Paige, *Air Defense Artillery*

Cadets Commissioned June 6, 1971

*Curtis A. Deloatch, *Adjutant General Corps*

*Vernon W. Hatley, *Air Defense Artillery*

*Paul L. Jones, *Military Intelligence*

*Joseph W. Levister, Jr., *Signal Corps*

*Alphonso E. Matthewson, Jr., *Field Artillery*

*James A. Monroe, *Field Artillery*

*Roscoe McCormick, *Medical Service Corps*

UNITED STATES ARMY RESERVE APPOINTMENT AND BRANCH**Cadets Commissioned June 6, 1971**

Richard E. Batts, *Military Police*

Odell D. Clanton, *Infantry*

Harold W. Creech, *Ordinance Corps*

Milton L. Grady, *Military Intelligence*

Robert L. Johnson, *Infantry*

Wilbert R. Joyner, *Infantry*

Gregory D. Talley, *Corps of Engineers*

James White, Jr., *Medical Service Corps*

* Distinguished Military Graduates

PRIZES AND AWARDS

The Merrick Award to the graduating senior for all-round excellence in Industrial Arts.

Clarence L. Goins

The Saslow's Incorporated, Medal Award to the graduating senior with the best record in the Social Sciences.

Lynn Wade Dorn

The Saslow's Incorporated, Medal Award to the graduating senior with the best record in the School of Arts and Sciences.

Samuel Adams Woods

The Florence Nightingale Award given by The Women's Auxiliary to the Greensboro Medical, Dental and Pharmaceutical Society to the most promising junior in the school of Nursing.

Gwennella Lamberth

The Elihue A. Barden Award to the Mechanical Engineering student in the junior class, maintaining the highest scholastic average and who exemplifies high moral character.

This award was established by his widow.

Ernest Franklin Womack

The ROTC Certificate of Meritorious Leadership Achievement is awarded to the Distinguished Military Graduate who most clearly displays the greatest leadership potential of any of his contemporaries.

. Joseph W. Levister, Jr.

Gordon Memorial Scholarship Award is presented to the most promising ROTC Military Science II Cadet.

John F. Pipkin

Kappa Delta Pi "The Kappa Delta Pi Scholarship" in Education.

Sylvia Johnson

The Band Awards for Four Years of Meritorious Service in The University Band.

Martha Crockett

John Dyer

Wendell Watson

Four Years of Meritorious Service in the University Choir.

Joseph Allen
Audrey Harris

Carolyn Mosely

Barbara Pierce
Donald Thompson

Three years of Meritorious Service in The University Choir.

Brenda Bowen
Angeline Clark
James Hill

Lindell M. Foster
Brenda Porter

Audrey Ross
Maurice Scott

Winner of the Andrew Rhodes Medal.

Donald O. Thompson

Certificates of Merit for Service in the James B. Dudley Chapter of the Student National Education Association.

Jannette Diane Bell

Rosa Graham

Gate City Chapter Scholastic Award for the graduating high school seniors in the Gate City Area.

Sheena Beasley—Ben L. Smith High School
Warren B. Richardson—Northeast Senior High School

Philadelphia Chapter, Alumni Association Trophy Award to the most Outstanding Athlete of the year.

Melvin Holmes

NATIONAL SCHOLASTIC PRESS ASSOCIATION AWARDS FOR HIGH JOURNALISTIC ACHIEVEMENT

THE STAR—for superior service to the A&T State University Register, a weekly publication with All-American honor rating in the National Newspaper Critical Service of the Associated Collegiate Press.

Hilliard B. Hines, Jr., Editor-in Chief

EDITOR'S AWARD—for experienced, competent workmanship to the Register.

Oliver Carson

Vernice Wright Pippen

Ronald P. Topping

JOURNEYMAN AWARD—for at least two years of dedicated and faithful service to the Register.

David L. Brown

Leonard Conley
Thomas E. Conway

Jacqueline Corpening

CUB AWARD—for one year of distinguished service to the Register.

EXCELLENT

Jacqueline Glisson
Ruth James
Janet Jones
Larry Lewis

GOOD

Patrice Dunn
George Johnson
William L. Johnson
Linda Merritt

SERVICE AWARD—for contributions of Valuable Time to the Register.

Jannette D. Bell
Delores Collins
W. Reginald Defour
Drusilla Dunn

Lorna Hines
Wanda Jones
Douglas McMillan, Jr.
Delores Mitchell

Clarence D. Robertson
Claire Withers Shank
Lance Van Landingham
Weldon Washington

ALUMNI ASSOCIATION AWARD for outstanding service with Future Alumni Activities Committee.

Jannette Bell (1969-71)	Walter Glover (1969-70)	Charlotte Pazant (1969-71)
Thomas Conway (1969-71)	Lizzie Miles (1970-71)	Charles Phillips (1970-71)
Charles Evans (1968-71)		Lillian Reddick (1970-71)

GRADUATING SENIORS HOLDING MEMBERSHIPS IN HONOR SOCIETIES**ALPHA KAPPA MU HONOR SOCIETY**

Shirley Belk
Jannette D. Bell
David Brown
Malcolm Cain
Elaine Farrior
Fred Freeman

Margaret Hammond
Ronald Haith
Jacqueline Harrison
Bobby Jackson
Martin Jackson
Joseph Levister

Irene Luckey
Clarie P. Withers Shank
Brenda Strickland
Samuel Woods
George Young

SIGMA RHO SIGMA RECOGNITION SOCIETY FOR SOCIAL SCIENCE MAJORS

Inza Howard
Paul Jones

Janet Wilson
Richard Batts

Oscar Beale
Wilbert Royal

KAPPA DELTA PI HONOR SOCIETY IN EDUCATION

Jannette D. Bell
Ronnie Broome
Malcolm E. Cain
Gilbert Casterlow

Linda D. Hairston
Martha A. Henderson
Clarence L. Goins

Valerie Lowe
Carol J. McKinnon
Donald O. Thompson
Patricia A. Vaughn

ENROLLMENT BY COUNTIES IN NORTH CAROLINA 1970-71

Alamance	53	Johnston	24
Alexander	1	Jones	17
Anson	11	Lee	16
Avery	1	Lenoir	52
Beaufort	23	Lincoln	5
Bertie	12	McDowell	1
Bladen	21	Martin	25
Brunswick	12	Mecklenburg	73
Buncombe	30	Montgomery	14
Burke	4	Moore	16
Cabarrus	28	Nash	28
Caldwell	10	New Hanover	27
Camden	1	Northampton	39
Carteret	19	Onslow	22
Caswell	27	Orange	20
Catawba	7	Pamlico	16
Chatham	31	Pasquotank	14
Cherokee	1	Pender	24
Chowan	6	Perquimans	7
Cleveland	19	Person	17
Columbus	41	Pitt	67
Craven	38	Polk	3
Cumberland	67	Randolph	20
Currituck	2	Richmond	27
Dare	3	Robeson	43
Davidson	16	Rockingham	57
Davie	4	Rowan	37
Duplin	36	Rutherford	7
Durham	77	Sampson	47
Edgecomb	60	Scotland	27
Forsyth	146	Stanly	7
Franklin	18	Stokes	12
Gaston	21	Surry	8
Gates	10	Tyrell	7
Graham	1	Union	10
Granville	25	Vance	22
Greene	18	Wake	104
Guilford	764	Warren	27
Halifax	40	Washington	14
Harnett	15	Wayne	55
Haywood	7	Wilkes	5
Henderson	1	Wilson	26
Hertford	24	Yadkin	3
Hoke	15		
Hyde	4		
Iredell	15		
		TOTAL	2877

ENROLLMENT BY STATES 1970-71

Alabama	6	Ohio	12
Alaska	2	Oklahoma	1
Arizona	1	Pennsylvania	63
California	3	Rhode Island	3
Colorado	1	South Carolina	207
Connecticut	22	South Dakota	1
Delaware	6	Tennessee	3
District of Columbia	50	Utah	1
Florida	33	Virginia	211
Georgia	47	Washington	4
Illinois	4	West Virginia	4
Indiana	1	Wisconsin	5
Iowa	1	Territories	2
Kansas	1		
Kentucky	2		
Louisiana	1		
Maryland	18		
Massachusetts	3		
Michigan	9		
Minnesota	1		
Mississippi	1		
New Jersey	77		
New York	91		
NORTH CAROLINA	2877		

FOREIGN COUNTRIES

Africa	8
India	5
China	6
Iran	2
West Indies	1

TOTAL 3797

SUMMARY OF ENROLLMENT 1970-71

Senior Class	877	Special Students	50
Junior Class	850	Graduate Students	231
Sophomore Class	779		
Freshman Class	1008	TOTAL	3797
5th Year (A. E. Only)	2		
Total Enrollment, Excluding duplicates, Regular Session 1970-71			3797
Summer Session, Undergraduates, 1971			1159
Summer Session, Graduate Students, 1971			749
GRAND TOTAL 1970-71			5706

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